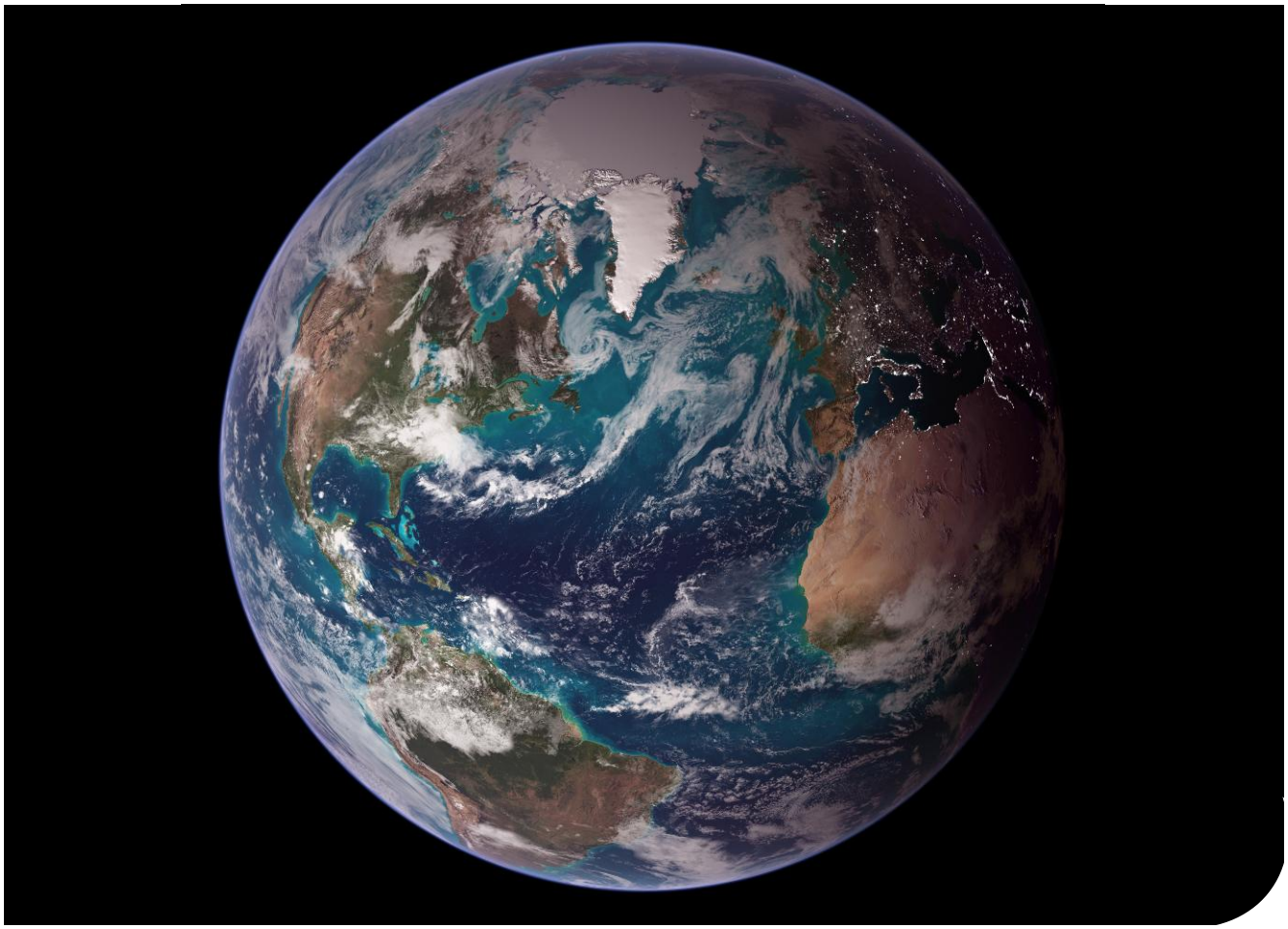
City of East Palo Alto

Final Climate Action Plan

Twenty-Three Actions to Address Our Changing Climate



December 2011

Prepared by KEMA, Inc. in collaboration with the City of East Palo Alto

East Palo Alto City Council

Carlos Romero, Mayor
Laura Martinez, Vice-Mayor
David E. Woods, Council Member
Ruben Abrica, Council Member
A. Peter Evans, Council Member

Interim City Manager

M.L. Gordon

East Palo Alto City Staff

Russell Averhart, RDA Project Manager
Brent Butler, Planning Division Manager
Sean Charpentier, RDA Project Coordinator
Anthony Docto, Public Works Director
Kamal Fallaha, City Engineer
Carlos Martinez, RDA Division Manager
Guido Persicone, Assistant Planner
Frank Rainone, Chief Building Official

East Palo Alto Planning Commission

Renee Glover Chantler, Chair
Robert Sherrard, Vice-Chair
Robert Allen, Member
Bernardo Huerta, Member
Jorge Prado, Member
Alex Quezada, Member
Courtland Skinner, Member
Kameelah Rasheed, Alternate

East Palo Alto Transportation Commission

Bernardo Huerta, Chair
Betsy Yanez, Vice Chair
Nancy Edelson, Member
Arthur Lee Gray, Member
Richard Tatum, Member
Richard Tso, Member

Funding provided by the City of East Palo Alto Redevelopment Agency

Copyright © 2011, KEMA, Inc.

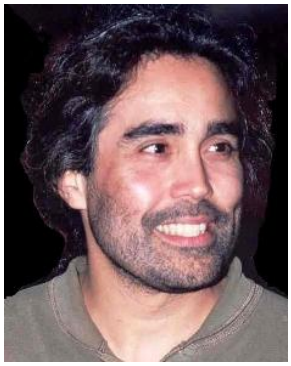
Table of Contents

LETTER FROM THE MAYOR iii
Acronyms and Abbreviations v
Executive Summary 1
1. Introduction 6
2. The Challenge of Climate Change 7
2.1 State Action on Climate Change 9
2.2 The Role of Cities in Climate Change 10
2.3 A Note on Adaptation 11
2.4 East Palo Alto's Climate Action Plan Process 12
2.4.1 Public Outreach and Community Engagement 13
2.4.2 The California Environmental Quality Act (CEQA) 14
3. Greenhouse Gas Inventory and Forecast 15
3.1 Inventory Sources and Data Collection Process 15
3.2 Baseline Emissions Inventory for 2005 17
3.2.1 Building Energy Emissions 19
3.2.2 Transportation Emissions 20
3.2.3 Solid Waste Emissions 22
3.2.4 Municipal Operations 23
3.3 Emissions Forecast for 2020 25
3.4 City of East Palo Alto Emissions Reduction Target 27
4. Climate Action Plan 29
4.1 Energy Use in Buildings 29
4.1.1 Goal E-1: Become more Energy Efficient 30
4.1.2 Goal E-2: Increase Renewable Energy 38
4.2 Transportation and Land Use 43
4.2.1 Goal TL-1: Prioritize Smart Growth Land Use 44
4.2.2 Goal TL-2: Improve Public Transportation 49
4.2.3 Goal TL-3: Encourage Walking and Bicycling 52
4.2.4 Goal TL-4: Increase Urban Green Space 55
4.3 Waste 57
4.3.1 Goal W-1: Promote Material Re-use 58
4.3.2 Goal W-2: Increase Recycling 58
4.3.3 Goal W-3: Increase Composting 64
4.4 Municipal Operations 65

Table of Contents

4.4.1 Goal MU-1: Increase Municipal Energy Efficiency and Renewable Energy ...66
4.4.2 Goal MU-2: Efficient Municipal Transportation....67
4.4.3 Goal: MU-3 Work towards Zero Waste Government Operations 67
4.4.4 Summary of Municipal Operations Goals and Measures 68
5. Implementation 70
5.1 Cost-Benefit Analysis....70
5.2 Results of the Cost-Benefit Analysis 72
5.3 Prioritization Methodology....75
5.4 Community Actions Recommended for Implementation....75
5.5 Municipal Operations Measures Recommended for Implementation....77
5.6 Meeting Emissions Targets....77
5.7 Community Education and Outreach 79
5.8 Monitoring Progress....80
6. Conclusion 82
Appendix A: Funding and Resources....83
Appendix B: 10 Steps to Reduce Your Carbon Footprint....87
Appendix C: City Council Resolution Number 4201 Adopting the CAP 89
Appendix D: CEQA Notice of Determination 90
Appendix E: Initial Study, Draft CAP, and Legal Notice....91

LETTER FROM THE MAYOR



Right now is a critical time for our community, our economy, and our environment. We are fortunate here in East Palo Alto to be surrounded by a wealth of knowledge and opportunity, venture capital investment, our residents' entrepreneurial spirit, strong environmental preservation principles, and a drive for innovative creation and natural resources protection. Unfortunately, these resources are at risk from the effects of climate change, which in the Bay Area and here in East Palo Alto will include sea-level rise, hotter summers, stronger storms, and increased air pollution.

Climate change is a global problem with local solutions. That is what this climate action plan is all about — things we can do as a community to protect the environment. Together, we can conserve energy and find new ways to utilize our scarce resources, thereby saving money and increasing opportunities in the emerging green economy. This plan is a comprehensive approach to sustainability, offering ideas such as providing city-sponsored loans to residents and businesses to retrofit their buildings with the most energy efficient technology or install rooftop solar panels; to building denser smart-growth communities that promote walking, bicycling, and public transportation over driving and sprawl; to minimizing the amount of waste headed for our landfills, which are nearing capacity. And last but not least, the plan includes ideas to make our city government an example of sustainable operations.

This small but important step is just the beginning of an exciting time of innovation during which East Palo Alto is taking the lead. We invite you to join the discussion to help us foster a clean environment, a healthy community, and a prosperous future.

Lastly, I would like to mention that the planning process that led to the development of the City's Climate Action Plan (CAP) was initiated under the leadership of former Mayor David Woods, and completed while I served as your Mayor.

Carlos Romero Mayor

[This page is left intentionally blank]

Acronyms and Abbreviations

AB32	The California Global Warming Solutions Act of 2006
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
CAP	climate action plan
CAPPA	Climate and Air Pollution Planning Assistant
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
EIR	environmental impact review
GHG	greenhouse gas
ICLEI	Local Governments for Sustainability
KPI	key performance indicators
kWh	kilowatt hour
MFD	multifamily dwelling
MPO	metropolitan planning organization
MT	metric ton
PACE	property-assessed clean energy
PG&E	Pacific Gas and Electric Company
ppm	parts per million
PV	photovoltaic
RPS	renewable portfolio standard
U.S. EPA	United States Environmental Protection Agency
TOD	Transit-oriented development

Executive Summary

Purpose

The Climate Action Plan (CAP) for East Palo Alto is a beginning of a long journey towards a more sustainable East Palo Alto. In these pages, the citizens of East Palo Alto will find suggested policies and programs that aim to reduce emissions, save energy (and money), and help East Palo Alto continue to grow into a beautiful and healthy place to live, work, and play.

The purpose of this CAP is to create a high-level guidance document and framework for actions the City of East Palo Alto can take to reduce greenhouse gas (GHG) emissions. This CAP includes a summary of GHG emissions in 2005, a goal for emissions reductions, and a set of goals and measures to be implemented over the next several years in order to achieve GHG emissions reductions. The emissions considered are those emitted in the community-at-large, as well as emissions from municipal operations of the City of East Palo Alto; also, emission reduction measures are provided for both the community, as well as the municipal government's operations. By adopting this climate action plan, the City is not obligated to implement all the policies described herein. Rather, the Plan provides a prioritized list of actions, each of which should be further developed, studied, and vetted independently before being implemented.

2005 Baseline Inventory, Emissions Forecast, and Reduction Target

The total emissions in 2005 were approximately 140,465 metric tons of carbon dioxide equivalents (CO_2e). Emissions were from the following sectors:

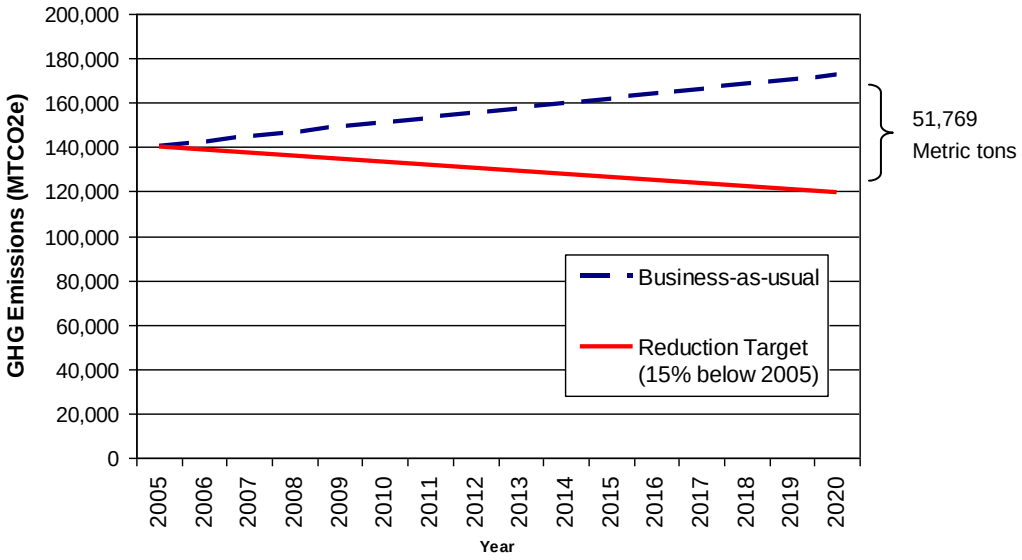
- Residential Buildings (18 %)
- Commercial and Industrial Buildings (17%)
- Transportation – Highways (48%)
- Transportation – Local Roads (14%)
- Transportation – Off-road equipment (1%)
- Waste (2%)

A forecast of emissions was developed to determine the level of emissions likely to occur in 2020 under business-as-usual conditions. The forecasted GHG emissions are based on the

emissions from the current growth pattern and General Plan prior to the adoption of this climate action plan. Therefore, the business-as-usual emissions are projected in the absence of any policies or actions that would reduce emissions, including landmark state legislation. The projections from the 2005 baseline year uses growth factors specific to each of the different economic sectors.

The emissions reduction goal chosen by the City is 15% below 2005 levels by 2020. This goal is consistent with California State Legislation (AB 32). The difference between the forecasted emissions in 2020 and the reduction target of 15% below 2005 levels is the emission reduction requirement for the City of East Palo Alto, which is shown in Figure 1.

Figure 1. East Palo Alto GHG Reduction Target (15% below 2005 levels by 2020)



Emission Reduction Measures

To reach the reduction goal of 15% below 2005 levels by 2020, the CAP provides a list of prioritized emission reduction measures. The GHG reduction measures and actions are structured around the four general categories of GHG emissions, as identified by the GHG inventory. They are:

1. Energy use in buildings (commercial/industrial and residential)
2. Transportation and land use
3. Waste
4. Municipal operations

The first three categories focus on programs and actions to influence the behavior of households and businesses in the community. Municipal operations are included as a separate category that encompasses City facilities, fleet, and waste operations, as the City has unique opportunities to directly control these emissions. However, City-related emissions account for only 1 percent of total East Palo Alto emissions.

The actions below are "green light" measures, based on the expected cost of implementation and expected GHG reductions, and are recommended for high priority in implementation.

- TL-1.2 – Continue to implement Ravenswood/4 Corners TOD strategy
- E-1.4 – Leverage existing programs and tax incentives for energy-efficiency audits and retrofits
- E-2.1 – Participate in PACE program
- E-1.1 – Establish a mandatory green-building checklist, such as GreenPoint Rated for new home construction and retrofit projects
- E-1.2 – Establish a mandatory green-building ordinance on all new commercial construction, based on CALGreen, LEED, or equivalent standard
- TL-1.1 Streamline projects that meet the following land-use criteria: increase density, affordable housing, TOD, and mixed-use zoning

The actions below are "yellow light" measures and are recommended as medium priority in implementation.

- TL-2.2: Promote education and outreach on pre-tax transit subsidies
- TL-3.2: Expand the *Safe Routes to Schools* program
- E-1.3 Promote water efficiency
- TL-4.1: Support efforts to plant trees in East Palo Alto
- W-1.1: Promote material re-use (5 points)
- W-2.1: Incentivize recycling and support multifamily building recycling solutions.
- E-2.2: Educate residents on solar PV and hot-water system installation

The actions below are "red light" measures and are recommended as low priority in implementation.

- TL-2.1: Improve bus service routes

- TL-3.1: Develop a master pedestrian and bicycle plan to promote walkable streets, bike lanes, and increased bike parking.
- W-2.2: Institute a mandatory requirement for businesses to recycle
- W-3.1: Institute a mandatory requirement for businesses to compost food scraps and ban non-biodegradable food containers

Once all state actions are taken into account that will reduce emissions in the City, a total of 19,111 metric tons of CO_2e need to be reduced by the City to reach the reduction target. The sum total of all reduction measures included in this CAP is 29,668 metric tons of CO_2e. Thus, if all measures are implemented, the City will surpass its reduction goal by 10,557 metric tons of CO_2e.

Implementation and Monitoring

While an important first step, this plan will remain a living document, to be updated as technology and policies progress. Some of the measures recommended for implementation may need additional study. Progress will be monitored on a regular basis, and the CAP will be updated as needed.

In addition, the below actions are recommended to promote regular, transparent reporting of progress towards meeting the City of East Palo Alto's GHG reduction goal.

- Hire a Sustainability Coordinator
- Establish an Interdepartmental and Community Based Climate Action Taskforce
- Launch a Climate and Sustainability Website
- Coordinate with San Mateo County and the City and Country Association of Governments (C/CAG)
- Track community-wide aggregate emissions

Conclusion

While the challenge of climate change is unprecedented, local-level solutions can reduce emissions, increase efficiency, promote economic development, and improve residents' quality of life. The City of East Palo Alto has taken a significant step forward for a more sustainable future with this climate action plan. The plan has identified areas and opportunities to reduce

GHG emissions within the community and City operations that along with statewide efforts can achieve our environmental goals. East Palo Alto is poised to reap the benefits of a clean energy economy, with policies that can increase the demand for local green jobs.

1. Introduction

Climate change is a critical issue facing California, the nation, and the world. It is indisputable that environmental changes are underway that present serious threats to our communities and livelihoods. The response to climate change is two-fold: adapting to the changes and mitigating the causes. This climate action plan (CAP) largely addresses the latter. The vision of the climate action plan is to develop a high-level stakeholder-driven plan to achieve significant, cost-effective greenhouse gas emissions (GHG) reductions within the City of East Palo Alto. The plan promotes sustainability, economic opportunity, livability, and healthy communities.

This climate action plan report is organized as follows. Section 2 discusses the challenge of climate change and how the State of California and local governments are rising to meet this challenge. Section 3 presents the results of municipal and community-wide greenhouse gas emissions inventories. Section 4 presents the climate action plan, including twenty-three discrete measures to reduce emissions through more efficient buildings, smarter transportation and land-use strategies, better waste management, and a more sustainable municipal government. Section 5 is the "Implementation" chapter. In this section, we look at the costs and benefits in depth of each measure and prioritize them.

2. The Challenge of Climate Change

Climate change presents one of the most profound challenges of our time. A broad international consensus exists among atmospheric scientists that the Earth's climate system is changing in response to elevated levels of greenhouse gas emissions in the atmosphere primarily from the combustion of fossil fuels for energy use.

A recent comprehensive study of climate impacts on the United States (U.S.), written by a task force of U.S. government science agencies, led by the National Oceanic and Atmospheric Administration,[1] states the following key conclusions:

1. **Global warming is unequivocal and primarily human-induced**. Average global temperature has increased over the past 50 years. This observed increase is due primarily to human-induced emissions of heat-trapping gases.

2. **Climate changes are underway in the United States and are projected to grow.** Climate-related changes have already been observed in the United States and its coastal waters. These changes include increases in heavy downpours, rising temperatures and sea level, rapidly retreating glaciers, thawing permafrost, lengthened growing seasons, lengthened ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows.

3. **Widespread climate-related impacts are occurring now and are expected to increase.** Climate changes are already affecting water, energy, transportation, agriculture, ecosystems, and health. These impacts are different from region to region and will grow under projected climate changes.

4. **Climate change will stress water resources.** Access to clean water is an issue in every region, but the nature of the potential impacts varies. Drought, related to reduced precipitation, increased evaporation, and increased water loss from plants, is an important issue especially in the West. Floods and water quality problems are likely to be amplified by climate change in most regions. Declines in mountain snowpack are important in the West and Alaska, where snowpack provides vital natural water storage.

5. **Crop and livestock production will be increasingly challenged.** Agriculture is considered one of the sectors most adaptable to changes in climate. However,

[1]U.S. Global Change Research Program 2009. "Global Climate Change Impacts in the United States." Page 12. http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts

increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production.

6. **Coastal areas are at increasing risk from sea-level rise and storm surge.** Sea-level rise and storm surges place many U.S. coastal areas at increasing risk of erosion and flooding, especially along the Atlantic and Gulf Coasts, Pacific Islands, and parts of Alaska. Energy and transportation infrastructure and other property in coastal areas are very likely to be adversely affected.

7. **Threats to human health will increase.** Health impacts resulting from climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. A robust public health infrastructure can reduce the potential for negative impacts.

8. **Climate change will interact with many social and environmental stresses.** Climate change will combine with pollution; population growth; overuse of resources; urbanization; and other social, economic, and environmental stresses to create larger impacts than from any of these factors alone.

9. **Thresholds will be crossed, leading to large changes in climate and ecosystems.** There are a variety of thresholds in the climate system and ecosystems. These thresholds determine for example the presence of sea ice and permafrost and the survival of species, from fish to insect pests, with implications for society.

10. **Future climate change and its impacts depend on choices made today.** The amount and rate of future climate change depend primarily on current and future human-caused emissions of heat-trapping gases and airborne particles. Responses involve reducing emissions to limit future warming and adapting to the changes that are unavoidable.

According to the current scientific consensus, a 2°C increase in average global temperature over the next century is a “safe” level of global warming. To minimize the average global temperature increase to 2°C, GHG concentrations need to be stabilized at a level well below 450 parts per million (ppm). Currently, global atmospheric concentration of GHGs stands at 380 ppm. Achieving this level requires global GHG emissions to be reduced by at least 50 percent below their 1990 levels by the year 2050.

2.1 State Action on Climate Change

The State of California has been a leader in developing and implementing policies and regulations to directly address the risk of severe climate change.

Assembly Bill 1493

In 2002, the California legislature enacted Assembly Bill (AB) 1493 (also known as "the Pavley Bill"), which directs the California Air Resources Board (ARB) to adopt standards that will achieve "the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles," taking into account environmental, social, technological, and economic factors. In September 2009, the ARB adopted amendments to the Pavley regulations to reduce GHG emissions in new passenger vehicles from 2009 through 2016.

The 33 Percent Renewable Portfolio Standard – In September 2010, the California ARB unanimously adopted a regulation raising California's Renewable Energy Portfolio (RPS) Standard to 33 percent by the year 2020. The current RPS law requires the state's investor-owned utilities (Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company) to sell at least 20 percent of their electricity generated from renewable resources. Renewable resources include wind, solar, geothermal, ocean wave, and small hydroelectric power. The new 33 percent regulation does not carry the force of law yet, as the legislature did not vote by the end of its session on a bill that would have enacted the 33 percent standard into law. A special session of the legislature may be called before the end of 2010 to attempt to enact the 33 percent standard into law.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, the California legislature passed Assembly Bill 32, which set the goal of reducing GHG emissions back to 1990 levels by 2020. AB 32 finds and declares that "global warming poses a serious threat to economic well-being, public health, natural resources and the environment of California." The legislation granted authority to the ARB to establish regulatory, reporting, and voluntary and market mechanisms to achieve quantifiable reductions in GHG emissions to meet the statewide goal. In December 2010, the Air Resources Board released their cap-and-trade framework that will be the primary regulatory vehicle for achieving emissions reductions.

Senate Bill 375

In September 2008, Senate Bill (SB) 375 was signed into law to provide emissions reduction goals related to vehicle-miles traveled at a regional planning level. The bill seeks to align regional transportation planning efforts with regional GHG reduction targets, and land use and housing allocations. SB 375 requires metropolitan planning organizations (MPO) to adopt a sustainable communities strategy or alternative planning strategy. The Air Resources Board, in consultation with MPOs, has set a per capita GHG reduction target for 7 percent below 2005 levels by 2020 and 15 percent below 2005 levels by 2035 for the San Francisco Bay Area for GHGs emitted by passenger cars and light trucks for 2020 and 2035 respectively.

Senate Bill 97

In February 2010, the California Office of Administrative Law approved the recommended amendments to the State California Environmental Quality Act (CEQA Guidelines for addressing GHG emissions. The amendments were developed to provide guidance to public agencies regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in draft CEQA documents. CEQA requires public agencies to review the environmental impacts of proposed projects, including General Plans and Specific Plans as well as specific kinds of development projects.

2.2 The Role of Cities in Climate Change

We live in a rapidly urbanizing world. Today, half of all humans live in cities. The United Nations estimates that this number is projected to grow to two-thirds by 2030. Moreover, more than half of the world's population now lives within 40 miles of the sea, and three-quarters of all large cities are located on the coast. Coastal cities are especially vulnerable to the impacts of climate change, experiencing stronger storms, heat-related wildfires, and rising sea levels.

While cities may be vulnerable to climate impacts, they also can play a critical role in reducing the emissions that exacerbate climate impacts. With their concentrations of people and activities at high densities, cities can use resources such as energy, materials, and land more efficiently. They are places where high-level knowledge-based activities congregate, with the expertise, to tackle climate change. This is especially true in the Bay Area.

AB 32 identifies local governments as essential partners in achieving California's goal to reduce GHG emissions. Local governments have primary authority to plan, zone, and permit how and where land is developed to accommodate population growth and the changing needs of their jurisdiction. They have varying degrees of responsibility for the collection and processing of

waste and have responsibility for other environmental infrastructures, such as energy and water. They own and manage buildings and vehicle fleets. They are able to form partnerships with private interests as well as mobilizing and coordinating community action. They are uniquely positioned to promote economic development that emphasizes sustainable development and local green jobs.

2.3 A Note on Adaptation

The climate is changing rapidly. According to the World Meteorological Organization, in their news release "2000-2009, The Warmest Decade."[2]

> *The decade of the 2000s (2000–2009) was warmer than the decade spanning the 1990s (1990–1999), which in turn was warmer than the 1980s (1980–1989)… The 2000 – 2009 decade will be the warmest on record, with its average global surface temperature about 0.96 degree F above the 20th century average.* ***This will easily surpass the 1990s value of 0.65 degree F.***

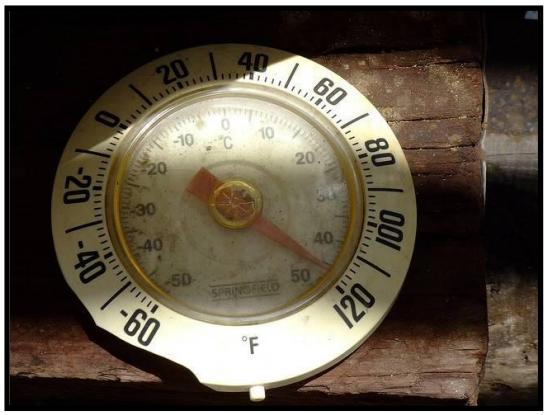


Photo by Saturnism via Flickr

Even if we stopped emitting GHGs tomorrow, the climate would still continue to change due to the length of the carbon cycle — the ability of the earth to absorb the excess carbon in the ocean and plants. Therefore, it is noted briefly here that cities must take the lead in planning for adaptation to climate change. Potential impacts to East Palo Alto include:

- Flooding in low-lying areas
- Increased smog and related respiratory illnesses
- Increased and higher intensity winter storms
- Increased vector-borne diseases, such as West Nile virus
- Increased extreme heat days

While no one knows exactly how climate change will affect the Bay Area, the best strategy is to be prepared for anything. Therefore, the City of East Palo Alto should monitor these changes

[2] WMO 2010. *2000–2009, THE WARMEST DECADE*
http://www.wmo.int/pages/mediacentre/press_releases/pr_869_en.html

and be prepared to take the necessary steps such as providing cooling centers on extreme heat days or building sea walls to mitigate sea-level rise.

2.4 East Palo Alto's Climate Action Plan Process

The City of East Palo Alto's (the City) climate action plan (CAP) is the culmination of a five-month long process, involving multiple rounds of stakeholder feedback. The City of East Palo Alto's climate strategy is based on the Local Governments for Sustainability (ICLEI) 5-Milestone process:

1. Conduct an inventory of city-wide GHG emissions
2. Set a reduction target/goal
3. Establish a climate action plan
4. Implement a climate action plan
5. Monitor and evaluate progress

The City completed Milestone 1 by working with the ICLEI to develop a 2005 emissions inventory for both community-wide and municipal operations. Milestones 2 and 3 are met through this document: the climate action plan.

The City hired KEMA, a professional services firm based in Oakland, California, to assist in the development of the CAP. KEMA worked with City staff to review climate action policies recommended in other Bay Area city climate action plans and together chose 23 measures to review in detail. Those measures were evaluated for costs and benefits and were ranked according to scoring criteria to help prioritize measures.

For each measure, KEMA researched the following:

- Measure description
- Estimated GHG reductions
- Costs and savings to the City government, residents, and businesses
- Cost effectiveness
- Co-benefits

For the cost-benefit analyses, KEMA relied on city-specific information, research, professional judgment, and the assistance of ICLEI's Climate and Air Pollution Planning Assistant (CAPPA).[3] CAPPA is a spreadsheet tool designed to help local governments explore, identify, and analyze potential climate emissions' reduction opportunities. CAPPA allows users to compare the relative benefits of a wide variety of emissions reduction measures and helps identify those most likely to be successful for a community, based on its priorities and constraints. CAPPA includes a customizable and expandable library of more than 110 distinct emissions-reduction strategies for local governments. Its calculation functions are based on real-world data from other U.S. communities and a variety of expert sources.

2.4.1 Public Outreach and Community Engagement

Strong public outreach is being implemented as a critical component to facilitate buy-in to achieve the climate action objectives outlined in this plan. Emails, postings, and stakeholder presentations, plus the following meetings are planned to be held to discuss the climate action plan:

- A community kick-off meeting, held on July 22, 2010 at City Hall
- A second community meeting was held on October 13, 2010 at City Hall
- A meeting with the Planning Commission and Public Works &Transportation Commission is scheduled for October 28, 2010 at City Hall
- Two meetings with City Council will be held on dates to be determined, but most likely will occur in November and December 2010.

Additional outreach was conducted to introduce the CAP process to members of the Ravenswood Business District, LLC, a property owners' advocacy organization, and Youth United Community Action, during a meeting at City Hall on September 27, 2010.

KEMA will incorporate the feedback from the community into revised drafts of the CAP. In all, the CAP will be revised as community input is received. Public comment is welcome at anytime during the revision process.

[3] http://www.icleiusa.org/action-center/tools/cacp-software

2.4.2 The California Environmental Quality Act (CEQA)

The Bay Area Air Quality Management District (BAAQMD) encourages local governments to adopt a qualified GHG reduction strategy that is consistent with AB 32 goals. The City of East Palo Alto is committed to reducing emissions by 15 percent below 2005 levels by 2020, in accordance to the AB 32 "Climate Change Scoping Plan" (Executive Summary, page 5). It is the City of East Palo Alto's intent to demonstrate that its collective set of climate action policies as described in this climate action plan, along with its General Plan, ordinances, and other programs should be considered equivalent to a qualified GHG reduction strategy.

The City's economic development activities are focused on creating a healthy and thriving business environment in East Palo Alto, and a number of projects are underway to meet this objective. According to the BAAQMD, if a project is consistent with a BAAQMD-qualified GHG reduction strategy, then it can be presumed that the project will not have significant GHG impacts. This approach is consistent with the following state CEQA Guidelines, Section 15183.5:

> a) *Lead agencies may analyze and mitigate the significant impacts of greenhouse gas emissions at a programmatic level, such as…a plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an environmental impact review EIR containing a programmatic analysis of greenhouse gas emissions.*

This climate action plan provides a foundation for future development efforts in the community. It is expected that future environmental documents will identify and incorporate specific applicable measures from this CAP for projects undergoing CEQA review.

3. Greenhouse Gas Inventory and Forecast

In 2008, a comprehensive community-wide inventory was completed on behalf of the City of East Palo Alto through *CO_2 San Mateo County*, a program funded in part by the BAAQMD. The GHG inventory quantifies the existing GHG emissions resulting from activities within the City of East Palo Alto. An initial aspect of the emissions inventory process is the requirement to select a base year for emissions, which will be used to establish a baseline emissions inventory against which all future inventories will be compared. The City of East Palo Alto selected 2005 as the base year.

The inventory provides an important foundation for the climate action plan, providing the 2005 baseline against which progress toward the City goal of reducing greenhouse emissions 15 percent below 2005 levels by 2020 can be measured. The inventory includes a business-as-usual (BAU) forecast of GHG emissions for 2020, which enables the City to estimate the amount of emissions reductions needed to meet its goal.

CO_2 San Mateo County contracted with ICLEI to provide technical support for completing the GHG-emissions inventory. The GHG inventory results outlined in this chapter are adapted from the County of San Mateo 2005 Community-Scale Greenhouse Gas Emissions Inventory report for the City of East Palo Alto.

3.1 Inventory Sources and Data Collection Process

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. The emissions inventory completed for the City of East Palo Alto follows the standard outlined in the BAAQMD's GHG Plan Level Quantification Guidance (dated April 15, 2010), as well as the draft International Local Government GHG Emission Analysis Protocol. The GHG inventory includes the following sectors, emissions sources, and energy types.

Table 1: Sectors and Emissions in the GHG Inventory

Sector	Emissions sources	Energy types
Residential	Energy and water use in residential buildings	Electricity Natural gas
Commercial	Energy and water use in commercial, government and institutional buildings	Electricity Natural gas
Industrial	Energy and water use in industrial facilities, and processes	Electricity Natural gas
Transportation	All road vehicles Public transportation Light rail Off-road vehicles/equipment	Gasoline Diesel Compressed natural gas Liquified natural gas Biodiesel
Waste	Landfills Waste stream	Landfill gas (methane)

As outlined in the emissions-inventory report, the community electricity and natural gas data was collected from Pacific Gas and Electric Company (PG&E). The transportation-related emissions were estimated using data sourced from The Metropolitan Transportation Commission (MTC), CalTrans, BAAQMD, and Bay Area Rapid Transit (BART). Solid waste data were gathered from the California Integrated Waste Management Board Disposal Reporting System.[4]

The East Palo Alto Sanitary District is responsible for maintaining the sanitary sewers in the City of East Palo Alto, a portion of the City of Menlo Park, and a nearby area in southeastern San Mateo County. The collection system carries wastewater from the District's service area to the Palo Alto Treatment Plant where it is treated and disposed of in a manner that meets federal and state standards. Since the wastewater treatment plant is not within East Palo Alto city limits, the methane and nitrous oxide emissions are not included in this inventory.

The community inventory represents all the energy used and waste produced within the City of East Palo Alto and their contribution to GHG emissions. The municipal inventory is a subset of the community inventory and includes emissions derived from internal government operations.

[4] http://www.ciwmb.ca.gov/lgcentral/DRS/Reports/default.asp

There are two main reasons for completing separate emissions inventories for community and municipal operations. First, the City is committed to action on climate change and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Second, by proactively reducing emissions generated by its own activities, the East Palo Alto government takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in East Palo Alto as well as for inspiring other communities.

When calculating East Palo Alto's emissions inventory, all energy consumed within the city's limits was included with the exception of electricity and natural gas consumption in County-owned facilities. This means that even though the electricity used by East Palo Alto's residents is produced elsewhere, the energy and emissions associated with them appear in East Palo Alto's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community.

3.2 Baseline Emissions Inventory for 2005

In the base year of 2005, the City of East Palo Alto emitted approximately 140,465 metric tons of carbon dioxide equivalent (CO_2e) from the residential, commercial, industrial, transportation, waste, and municipal sectors.[5] Burning fossil fuels in vehicles and for energy use in buildings and facilities are the largest contributors to East Palo Alto's GHG emissions. Table 2 provides a summary of total citywide (i.e. community and municipal) GHG emissions.

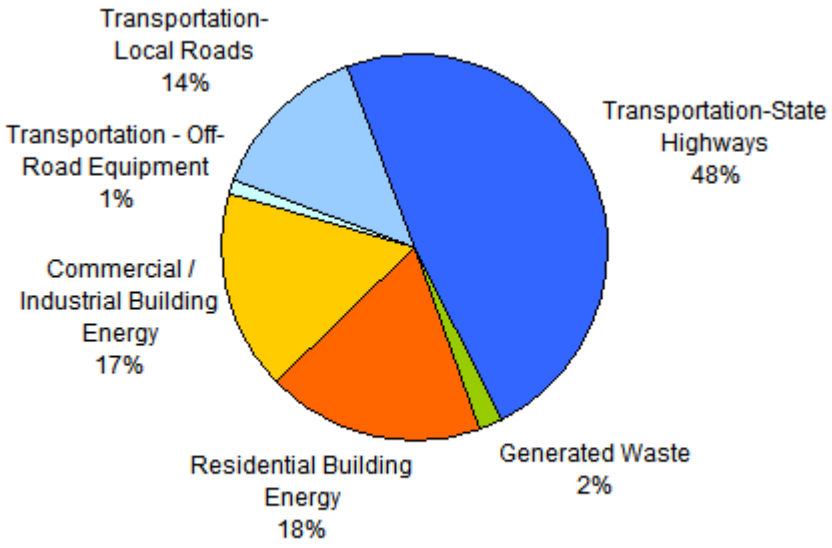
[5] Carbon dioxide equivalent is a unit of measure that normalizes the varying climate warming potencies of all six GHG emissions, which are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). For example, one metric ton of methane is equivalent to 21 metric tons of CO_2e. One metric ton of nitrous oxide is 210 metric tons of CO_2e.

Table 2. East Palo Alto Community Emissions Summary (2005)

Emissions Sources	CO_2e (metric tons)
Transportation – Highway	67,286
Buildings - Residential	24,838
Buildings - Commercial/Industrial	23,222
Transportation – Local roads	19,715
Waste	3,360
Transportation – Off-road equipment	2,044
TOTAL	**140,465**

The residential, commercial, and industrial sectors represent emissions that result from electricity and natural gas used in both private- and public-sector buildings and facilities. The transportation sector includes emissions from private, commercial, and fleet vehicles driven within the City's geographical boundaries as well as the emissions from transit vehicles and the City-owned fleet. Off-road equipment includes lawnmowers, garden equipment, and construction, industrial, and light commercial equipment. Figure 2 shows the proportion of East Palo Alto's total GHG emissions from all major sources for 2005.

Figure 2. Community Emissions by Sector (2005)


Transportation-Local Roads 14%
Transportation - Off-Road Equipment 1%
Commercial / Industrial Building Energy 17%
Residential Building Energy 18%
Generated Waste 2%
Transportation-State Highways 48%

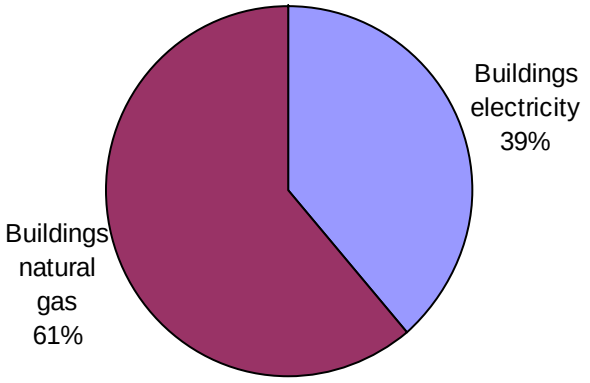
As shown above, the two largest categories of emissions are related to transportation (highway travel, local travel, and off-road equipment) and building energy use (both residential and commercial & industrial).

3.2.1 Building Energy Emissions

In 2005, East Palo Alto's total stationary energy consumption was about 76,764,805 kilowatt-hours (kWh) of electricity and 5,500,863 therms of natural gas, including municipal facilities and direct access customers.[6] Stationary energy use by all community sectors (residential, commercial, industrial, and municipal activities), primarily the combustion of natural gas, accounts for 35 percent of total GHG emissions in East Palo Alto. East Palo Alto's stationary energy use resulted in a total of approximately 48,060 metric tons of CO_2e emissions in 2005.

Of the total 48,060 metric tons of CO_2e emitted due to building energy use, the residential and commercial/industrial sectors contribute about the same amount of GHG emissions annually. Figure 3 shows that natural gas combustion overall contributes almost two-thirds of emissions related to building energy use, mostly attributable to residential consumption.

Figure 3. Building Energy Use – Fuel Type



Source: CACP Model output

[6] Estimations of electricity purchased through direct access (DA) contracts are derived from county-level DA consumption figures, provided by the California Energy Commission (CEC). The countywide ratio of DA to utility-supplied electricity is multiplied by a community's utility-supplied energy use to determine the amount of DA in a given community. According to the CEC, DA was 20.89% of "non-residential" electricity consumption and 55.08% of "non-residential" natural gas consumption in San Mateo County in 2005.

In 2005, East Palo Alto's 30,000 residents consumed 35,786,159 kWh of electricity, or about 5,037 kWh per household,[7] and 3,148,228 therms of natural gas, or about 443 therms per household. This consumption resulted in a release of 24,838 metric tons of CO_2e. Major residential energy uses include refrigeration, lighting, and water heating.

Similarly, commercial and industrial sector buildings consumed 40,978,646 kWh of electricity and 2,352,635 therms of natural gas. This consumption resulted in a release of 23,222 metric tons of CO_2e into the atmosphere.

The City of East Palo Alto receives its electricity from Pacific Gas & Electric Company (PG&E). The 2005 emissions coefficient for electricity provided by PG&E was approximately 0.493 lbs/kWh[8] and is subject to change annually due to fluctuations in hydroelectric output.

3.2.2 Transportation Emissions

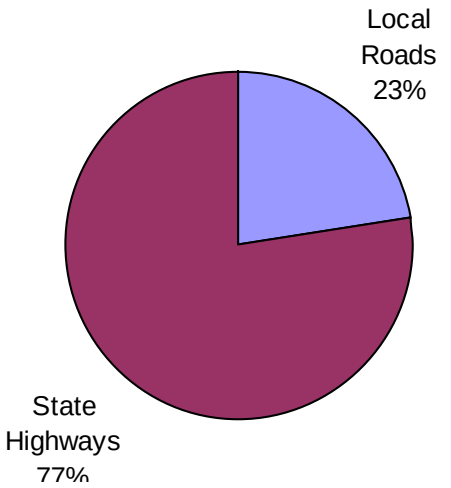
The transportation sector is responsible for about 63 percent of East Palo Alto's GHG emissions when including vehicle emissions on state highways within city limits, local roads and off-road use. On-road motor vehicles driven within the City's geographical boundaries on both local and state roads emitted approximately 87,001 metric tons of CO_2e in 2005, compared with 2,044 tons from off-road equipment.

Figure 4 shows the breakdown of GHG emissions by vehicle miles traveled (VMT) from local roads and VMT from state highways. Of the total 87,001 metric tons of CO_2e emitted, only 23 percent was from local roads and 77 percent was from regional traffic on state highways. The state highways in East Palo Alto include CA 84 (Bayfront Expressway), CA 114 (Willow Road), and CA 109 (University Avenue). Thus, more than three-fourths of the CO_2 emitted in East Palo Alto comes from regional traffic.

[7] 7,104 households (2009 United States Census Bureau)

[8] Note that the types of power sources that make up a utility's electricity generation mix have a significant impact on a city's greenhouse gas emissions. The average coal-fired power plant releases 1.3 metric tons of CO_2e per megawatt-hour of electricity generated compared with 0.7 metric tons for gas turbines and 0.0 metric tons for nuclear and renewable sources such as solar, wind, or hydroelectric power. PG&E's power mix is comprised of approximately 45 percent natural gas, 22 percent natural gas, 17 percent large hydroeletric, 14 percent renewable energy, and 2 percent coal. (Source: www.pge.com)

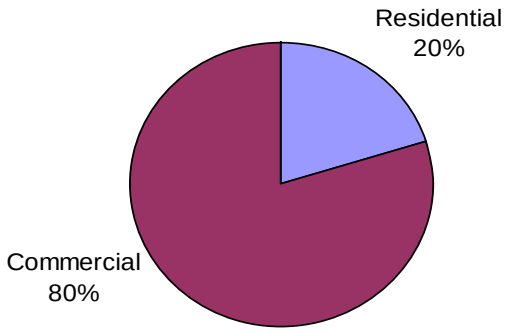
Figure 4. Transportation Emissions – Highways versus Local Travel



Calculations for transportation emissions are based on figures for total vehicle-miles-traveled (VMT) in the City of East Palo Alto. The Metropolitan Transportation Commission (MTC) supplied the necessary VMT data, while BAAQMD provided vehicular fuel data to break down total VMT by percentage driven for a given vehicle type.

While off-road equipment comprises a relatively small portion of transportation and total community emissions, it is estimated that the majority of off-road emissions are related to commercial equipment. Residential off-road equipment includes lawn and garden equipment, such as mowers. Commercial off-road equipment includes construction, and industrial and light commercial equipment including tractors, forklifts, leaf blowers, and so forth.

Figure 5. Transportation Emissions – Residential versus Commercial Off-road Equipment



3.2.3 Solid Waste Emissions

In 2005, East Palo Alto sent approximately 18,362 metric tons of solid waste to landfills resulting in 3,352 metric tons of CO_2e emissions. Another eight metric tons of CO_2e emissions are estimated for the alternative daily cover used to cover the surface of the active face of the municipal landfill to control odors, blowing litter, and scavenging.

Emissions from waste result from organic materials decomposing in the anaerobic environment of a landfill that produces methane—a GHG 21 times more potent than carbon dioxide. Organic materials (e.g., paper, plant debris, food waste, and so forth) generate methane within the anaerobic environment of a landfill while others do not (e.g., metal, glass, and so on). Table 3 shows the approximate breakdown of the materials East Palo Alto sent to landfills in 2005. Materials that do not release GHGs as they decompose are included in the "All Other Waste" category.

Table 3. East Palo Alto Waste Composition[9]

Waste Type	Waste Share
Paper Products	21.0 %
Food Waste	14.6 %
Plant Debris	6.9 %
Wood/Textiles	21.8 %
All Other Waste	35.7 %
Total	**100 %**

Some landfills recover this methane either for energy generation or flaring, converting it back into carbon dioxide. The EPA estimates that 60 to 80 percent of methane is recovered at the landfills where East Palo Alto sends its waste. Following the recommendation of the Local Government Operations Protocol for quantifying GHG emissions inventories, the City of East Palo Alto is assuming a 75 percent methane recovery factor.

Recycling and composting programs were taken into account as *reduced total tonnage* of waste going to the landfills. The ICLEI methodology does not accurately capture the associated emissions reductions in "upstream" energy use from recycling. Despite this limitation, recycling and composting programs can have a significant impact on GHG emissions. Manufacturing products with recycled materials avoids emissions from the energy that would have been used during extraction, transporting, and processing of virgin raw materials. Recycling paper also conserves forests, which contribute to carbon sequestration— a process that removes carbon from the atmosphere and stores it for long periods of time.

3.2.4 Municipal Operations

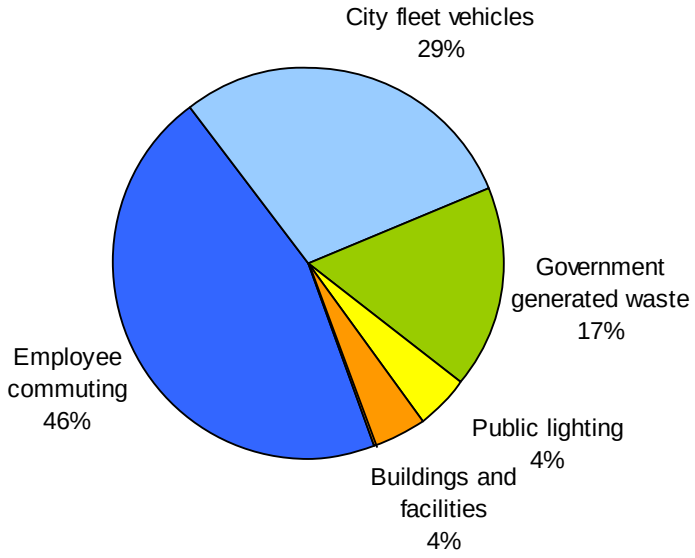
In 2005, the base year, East Palo Alto's municipal operations generated 1,337 metric tons of CO_2e. As Table 4 and Figure 6 show, the City's vehicle fleet accounted for the majority of emissions at 49 percent of total emissions.

[9] Waste characterization: CIWMB 2004 Statewide Waste Characterization Study. This state average waste characterization accounts for residential, commercial and self-haul waste. http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097

Table 4. Municipal Operations - Emissions Summary

Emissions Sources	CO_2e (metric tons)
Employee commuting	605
City fleet vehicles	391
Government-generated waste	223
Public lighting	59
Buildings and facilities	58
Water transport	1
TOTAL	**1,337**

Figure 6. Municipal Operations – Greenhouse Gas Emissions



Municipal emissions in East Palo Alto constitute less than one percent of East Palo Alto's total emissions. This is on the low end of the typical range, as local government emissions generally comprise between one and five percent of overall community emissions. Although actions to reduce municipal energy use may have a limited impact on East Palo Alto's overall community emissions levels, municipal action can help reduce operation costs and has symbolic value by demonstrating leadership that extends beyond the magnitude of emissions actually reduced.

Beyond reducing GHG emissions, any future reductions in municipal energy consumption will have the potential to reduce municipal expenditures, enabling East Palo Alto to reallocate limited funds toward other municipal services or programs for the community.

In 2005, East Palo Alto municipal buildings and facilities consumed 175,220 kWh of electricity and 3,476 therms of natural gas, which resulted in a release of 58 metric tons of CO_2e emissions into the atmosphere. Municipal streetlights and traffic lights consumed 265,021 kWh of electricity, which resulted in a release of 59 metric tons of CO_2e emissions into the atmosphere.

The City's vehicle fleet consumed approximately 42,968 gallons of fuel and emitted about 391 metric tons of CO_2e. The municipal fleet includes all vehicles owned and operated by the City of East Palo Alto.

The City of East Palo Alto government operations reported sending 877 tons of waste to the landfill, resulting in 223 metric tons of CO_2e, according to the method described above.

3.3 Emissions Forecast for 2020

Based on the 2005 community and municipal operations emissions inventories, KEMA projected a forecast of future emissions for the year 2020. The emission forecast represents a "business-as-usual" prediction of how GHG emissions would grow in the absence of GHG policy. Conducting an emissions forecast is essential for developing the climate action plan because one must compare future reductions with future emissions levels, not current levels.

The projected GHG emissions are based on the emissions from the current growth pattern and General Plan prior to the adoption of this climate action plan. Therefore, the business-as-usual emissions are projected in the absence of any policies or actions that would reduce emissions, including landmark state legislation described in Section 2.1. The projections from the 2005 baseline year uses growth factors specific to each of the different economic sectors. Table 5 below summarizes the results of the forecast.

Table 5. East Palo Alto Emissions Forecast for 2020

Emissions Sources	2005 ($MTCO_2$)*	2020	Annual Growth Rate	Percent change from 2005 to 2020
Residential	24,838	28,618	0.95%	15.2%
Commercial/Industrial	23,222	27,200	1.06%	17.1%
Transportation	89,045	111,475	1.51%	25.2%
Waste	3,360	3,871	0.95%	15.2%
TOTAL	**140,465**	**171,164**	**1.33%**	**21.9%**

* metric tons carbon dioxide

The following bullet points explain how the emissions forecast was estimated for each sector:

- For the residential energy sector, the compounded annual population growth rate was calculated from 2005 through 2020 using population projections from Association of Bay Area Governments (ABAG) Projections 2009. The baseline GHG inventory assumes a population of 32,200 in 2005 with an anticipated population of 37,100 in 2020. This corresponds to a 0.95 percent annual growth rate.

- For the commercial energy sector, KEMA relied on the analysis contained within "California Energy Demand 2008-2018: Staff Revised Forecast,"[10] a report by the California Energy Commission (CEC), which shows that commercial floor space and the number of jobs have closely tracked the growth in energy use in the commercial sector. Using regional job projections for the San Francisco Bay Area from ABAG's *Projections 2009,*[11] it was calculated that the compounded annual growth in energy use in the commercial sector from 2005 to 2020 to be 1.06 percent.

- For transportation, KEMA relied on "Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report," in which the CEC projects that on-road VMT will increase at an annual rate of 1.509 percent per year through 2020.[12] This is the number that was used to estimate emission growth in the transportation sector for the East Palo Alto forecast. The recently passed federal Corporate Average Fuel Economy standards and the State of California's pending tailpipe emission standards could significantly reduce the demand for transportation fuel in East Palo Alto. An analysis of potential fuel savings from these measures has not been included in this business-as-usual forecast. Regardless of future changes in the composition of vehicles on the road as a result of state or federal rulemaking, emissions from the transportation sector will continue to be largely determined by growth in VMT.

- For waste-related emissions growth, the primary determinate for growth in emissions for the waste sector is population. Therefore, the compounded annual population growth rate for 2005 to 2020 of 0.95 percent (the same as the residential sector projection) was used to estimate future emissions in the waste sector.

[10] http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDF

[11] http://www.abag.ca.gov/planning/currentfcst/regional.html#

[12] Report available at: http://www.energy.ca.gov/2007publications/CEC-600-2007-009/CEC-600-2007-009-SF.PDF. Compounded Annual growth rate for 2005-2020 is calculated from Table 4 on page 12. In light of recent fuel cost increases, the calculation assumes high fuel cost scenario.

3.4 City of East Palo Alto Emissions Reduction Target

The City of East Palo Alto is committed to a GHG emissions reduction target of 15 percent below the baseline 2005 levels by 2020. This goal is consistent with the AB 32 Scoping Plan and the Bay Area Air Quality Management District guidelines for a qualified GHG emission reduction strategy.

Figure 6 below illustrates how the business-as-usual emissions are estimated to increase, thus widening the emissions reductions needed by 2020.

The City of East Palo Alto is committing to reducing community-wide greenhouse gas emissions 15 percent by 2020, a reduction of 51,769 metric tons of carbon dioxide equivalent

Figure 7. East Palo Alto GHG Reduction Target (15% below 2005 levels by 2020)

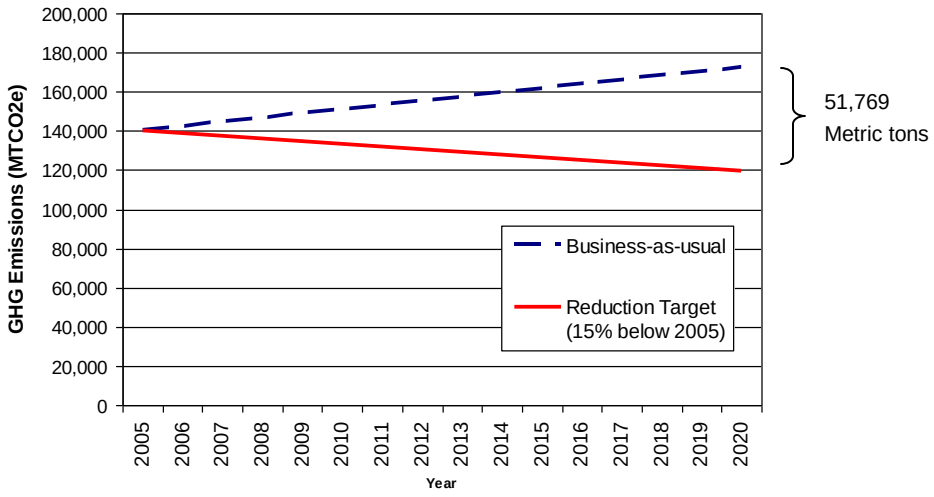


Table 6 also demonstrates the emissions' reduction target taking into account natural emissions growth under the business-as-usual scenario. The City of East Palo Alto would need to reduce emissions by 51,769 metric tons to meet the GHG reduction target of 15 percent below 2005 levels.

Table 6: GHG Emissions Projection and Reduction Target

2005 Emissions ($MTCO_2e$)	2020 Target Emissions at 15% below 2005 ($MTCO_2e$)	2020 BAU Emissions ($MTCO_2e$)	Emissions Reductions Required ($MTCO_2e$)
140,465	119,395	171,164	51,769

Although residential development within the City contributes to some increase in emissions for the East Palo Alto community, the relative impact of new development is likely significantly lower compared to low-density development in the distant suburbs. Given the large proportion of emissions related to highway VMTs through East Palo Alto, local jurisdictions around the San Francisco Bay Area and beyond must work together to develop regional solutions.

4. Climate Action Plan

The climate action plan for East Palo Alto is a beginning of a long journey towards a more sustainable East Palo Alto. In these pages, the citizens of East Palo Alto will find suggested policies and programs that aim to reduce emissions, save energy (and money), and help East Palo Alto continue to grow into a beautiful and healthy place to live, work, and play.

By adopting this climate action plan, the City is not obligated to implement all the policies described herein. Rather, the Plan provides a prioritized list of actions, each of which should be further developed, studied, and vetted independently before being implemented.

As described above, the GHG reduction measures and actions are structured around the four general categories of GHG emissions, as identified by the GHG inventory. They are:

5. Energy use in buildings (commercial/industrial and residential)
6. Transportation and land use
7. Waste
8. Municipal operations

The first three categories focus on programs and actions to influence the behavior of households and businesses in the community. Municipal operations are included as a separate category that encompasses City facilities, fleet, and waste operations, as the City has unique opportunities to directly control these emissions. However, City-related emissions account for only 1 percent of total East Palo Alto emissions.

4.1 Energy Use in Buildings

In the U.S., buildings account for 70 percent of total electricity use and about 40 percent of GHG emissions.[13] Design and construction of new buildings, or major renovation of existing ones, provide an opportunity to implement energy-saving measures that reduce GHG emissions.

The State of California has long been a leader in implementing policies aimed at improving the energy efficiency of its building stock. The state is committed to first meet its energy needs "through all available energy efficiency and demand reduction resources that are cost effective,

[13] Fuller *et al.* 2009. *Toward a Low-Carbon Economy: Municipal Financing for Energy Efficiency and Solar Power*. Environment Magazine

reliable and feasible."[14] Since the 1970s, California has led the nation in developing and implementing successful energy-efficiency efforts. More recently, California has set targets for "net-zero-energy" new buildings, in which efficiency and on-site generation are combined to reduce residential buildings to zero net-energy use by 2020 and commercial buildings by 2030.[15]

While not the largest emissions category, building energy is the sector with the most immediately achievable and affordable reduction opportunities. Energy efficiency is the most cost-effective measure for GHG reductions and also has numerous co-benefits such as cost savings over time and promotion of green collar jobs. Along with energy efficiency, California has an abundance of natural resources and a long history of supporting renewable energy generation. With the idea of "reduce, then produce," a sensible energy policy seeks to first maximize energy efficiency and then look to generate electricity with low-carbon fuels and renewable resources.

In this chapter, we examine potential City programs and initiatives that will promote energy efficiency and renewable energy in both existing and new buildings.

4.1.1 Goal E-1: Become more Energy Efficient

The actions that the City of East Palo Alto can take to promote energy efficiency span mandatory building standards, to programs that offer financial support and incentives for upgrades, to specific activities to educate homeowners in order to overcome informational barriers to energy efficiency. A number of specific ideas and actionable measures are presented below for consideration.

[14] "Energy Action Plan I", California Energy Commission, California Public Utilities Commission and Consumer Power and Conservation Financing Authority. May 8, 2003. Available at: http://docs.cpuc.ca.gov/word_pdf/REPORT/28715.pdf

[15] California Energy Commission, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF

4.1.1.1 Measure E-1.1: Establish a green building checklist, such as GreenPoint rated, for new home construction and retrofit projects

Measure Description: Green building design views buildings as a complete system in order to maximize health, comfort, and productivity of occupants while minimizing resource use for construction and operation. Many municipalities in the Bay Area have instituted mandatory "green building" policies affecting both residential and commercial new construction.

Measure Summary	
GHG Emissions Reduction	2,612 Metric Tons
Initial City Costs	$100,000
Cost Effectiveness	$38/metric ton

The enactment of local green-building requirements has been facilitated by the development of several independent rating systems increasingly used in the building industry to objectively evaluate "green" buildings. One rating system used by local governments in their green-building ordinances is the "GreenPoints Rated" program first developed by a coalition of Alameda County waste agencies (http://stopwaste.org) and promoted by Build It Green, a nonprofit organization based in Berkeley, California (http://www.builditgreen.org). The GreenPoints Rated system, while similar in approach to the Leadership in Energy and Environmental Design (LEED), is focused on residential development, including separate guidelines for single-family and multifamily buildings. GreenPoint Rated is much more prescriptive and easier to implement than LEED, and is therefore recommended over LEED for implementation.

Several cities or counties have developed their own "points" systems using guidelines and checklists based on the GreenPoint Rated system. These include guidelines developed by the Sonoma County Waste Management Agency (http://www.recyclenow.org) and the City of West Hollywood (http://www.weho.org/greenbuilding/). These alternative systems award points for many of the same practices, such as the use of fly ash in concrete,

the recycling of construction debris, and the installation of overhangs.

This measure recommends that East Palo Alto either adopt the Greenpoint Rated system and require new home construction to achieve at least 50 GreenPoints, or to develop a customized equivalent system. We assume that a 20 percent improvement over California's Title 24 energy requirements while ambitious is achievable at reasonable cost.

GHG Reduction: According to East Palo Alto's *Draft Housing Element*, the 2020 population will be 38,700, an increase of 4,300 persons from 2010.[16] Assuming 0.53 new household units (a California average suggested by CAPPA) constructed to accommodate this population growth, we estimate that East Palo Alto can expect 2,279 new housing units by 2020. Assuming a 20 percent improvement in energy performance as compared with existing code and using PG&E's GHG emissions intensity,[17] CAPPA estimates a reduction of 2,612 metric tons of CO_2e.

Costs and Savings: The City would need to evaluate the GreenPoint Rated and other green-buildings' codes and decide on which requirements it would like to adopt as part of its municipal building code. City building inspectors would need to be trained in the new code and how to enforce it. The code would need to be changed through the normal process. We estimate the initial cost to the city to be approximately $100,000.

Studies have shown[18] little to no incremental costs for constructing buildings to a LEED *Certified* or *Silver* level. Incremental costs increase as buildings attempt for LEED *Gold* and *Platinum* levels. East Palo Alto's Green Building Policy could be designed to achieve significant savings without imposing a large green incremental-cost burden on developers.

Residents will enjoy significant cost savings over the lifecycle of the building. According to CAPPA, a green building code with a 20 percent energy performance improvement can save the community $1,165,622 annually in energy costs, a $511 per household savings.

[16] AECOM 2010. *East Palo Alto Draft Housing Element.*

[17] 0.000291 metric tons of CO_2 per kWh (2008 CARROT report). www.climateregistry.org

[18] i.e. http://www.davislangdon.com/upload/images/publications/USA/The%20Cost%20of%20Green%20Revisited.pdf and http://www.cleanair-coolplanet.org/for_communities/LEED_links/AnalyzingtheCostofLEED.pdf

4.1.1.2 Measure E-1.2: Establish a green building policy for new commercial construction and major renovation based on CAL Green, LEED, and/or other green building standards

Measure Summary	
GHG Emissions Reduction	2,078 Metric Tons
Initial City Costs	$100,000
Cost Effectiveness	$48/metric ton

Measure Description: Like Measure E-1.1, Measure E-1.2 seeks to address the performance of buildings in the commercial sector. Implementing a green building ordinance, such as CALGreen, LEED, or similar,[19] promotes energy-efficient workplaces that cause fewer GHG emissions.

Early in 2010, California's Building Standards Commission and the Department of Housing and Community Development finalized the first statewide mandatory green building code in the country for newly constructed buildings: Title 24 Part 11 of the California Building Standards Code (commonly called "CALGreen"). The 2010 California Green Building Standards Code is a code with mandatory requirements and voluntary "tiers" for new commercial buildings (including buildings for retail, office, public schools, and hospitals) throughout California beginning on January 1, 2011. CALGreen has two tiers: Tier 1 requires 15 percent improvement and Tier 2 requires a 30 percent improvement over Title 24 energy standards respectively.

This measure recommends researching the available commercial green building standards and adopting an appropriate code for the City of East Palo Alto. For example, the City of East Palo Alto could adopt the CALGreen Tier 1 requirement of 15 percent above Title 24 standards. Alternatively, the City could require new construction to achieve certain prerequisites and credits from the LEED Building Design and Construction system.

[19] For a comparison of CALGreen to LEED BD&C, see http://www.usgbc-ncc.org/storage/usgbcnccdev/documents/advocacy/gbcec_2010_calgreen_non_residential_leed_comparison.pdf

California jurisdictions have an opportunity to take advantage of the benefits of both CALGreen and third-party rating systems and help facilitate the way they work together and inform each other's development. With this goal in mind, KEMA recommends following the Bay Area Climate Collaborative's [20]recommended adoption and implementation pathway for local governments.

1. Prioritize education and enforcement of the CALGreen mandatory provisions. Allow rating-system documentation as compliance of directly compatible mandatory CALGreen measures.
2. Where a local leadership standard is desired, continue to apply the LEED rating systems. File an application to the CEC and submit findings to the California Building Standards Commission as appropriate and required by law for any ordinance that includes standards in excess of California's building- and energy-code baselines.
3. Should a local government adopt a CALGreen Tier, also accept third-party certified LEED or GreenPoint Rated requirements in lieu of the Tier requirements. In other words, green building certification at a given level should be accepted as fulfilling local green building requirements *above and beyond* the CALGreen mandatory measures.

GHG Reduction: Assuming 1,600,000 square feet of new commercial space is constructed by 2020[21], and assuming a 15 percent improvement of energy efficiency over existing commercial building performance, we estimate a GHG reduction benefit of 2,078 metric tons of CO_2e.

Costs and Savings: The initial cost to the city would be similar to the initial cost of measure E-1.1; therefore, we also estimate an initial city cost of $100,000. Negligible incremental costs are expected for the construction of energy-efficient commercial buildings. Businesses tenants are expected to save significantly on energy costs, estimated by CAPPA to be $1,008,288 per year of savings community-wide.

4.1.1.3 Measure E-1.3: Promote water efficiency

Measure Description: Water and energy are linked. It takes natural gas or electricity to heat water in hot water tanks for showers, sinks, and clothes washers. It also requires energy to pump, treat, and transport water to customers as well as treat the resultant wastewater.

[20] Bay Area Climate Collaborative 2010. *A Recommended Approach to California's New Green Building Code*. August

[21] An adjustment of CAPPA's assumption of 4,000,000 sq ft. of new commercial for a city of 100,000 residents.

Nearly 20 percent of statewide energy is used to transport water.[22]

Measure Summary	
GHG Emissions Reduction	534 metric tons
Initial City Costs	$50,000
Cost Effectiveness	$93/metric ton

Three companies provide water to East Palo Alto residents: Palo Alto Park Mutual, O'Conner Tract Water Co-op, and American Water. Of these three, only American Water offers a $50 rebate for the purchase of low-flow toilets.

This measure would entail two actions:

- **Education and Outreach -** The City would work with the water utilities to initiate water efficiency education of residents and businesses, including classes and awareness campaigns. A number of efficiency programs exist on a statewide basis to provide rebates for water-efficient fixtures. Upgrading to a water-efficient hot water heater, as well as using low-flow toilets, sinks, and shower heads can greatly reduce water consumption and therefore reduce home energy use. The City can educate and promote these statewide programs through education and outreach, including a webpage, billboards, and mailers.

- **Building Codes -** The City building code could require a specific percentage increase in water efficiency for new construction. This could be amended as part of the green building standards described in measures E-1.1 and E-1.2, as LEED and other standards provide guidance for water-efficient buildings.

GHG Reduction: We assumed this measure would result in a 15 percent improvement in water efficiency by 2020. According to CAPPA, this improvement would result in a reduction of 534 metric tons of CO_2e as well as 288,700,145 gallons of water and 1,558,891 kWh saved.

Costs and Savings: We assumed that costs could vary significantly depending on whether measures E-1.1 and E1.2 are implemented. If the code changes are made as part of implementing a broader green building policy, then the incremental cost of this measure is negligible. We estimate a $50,000 budget to be spent on preparing the water efficiency website, billboards, and mailers and changing the code.

[22] California Energy Commission 2005. *California's Water-Energy Relationship.* CEC-700-2005-011-SF.

4.1.1.4 Measure E-1.4: Leverage existing energy efficiency programs and tax incentives for energy-efficiency audits and retrofits

Measure Description: In East Palo Alto, approximately 52 percent of the housing stock was built before 1960 and 81 percent before 1980. Therefore, a significant emphasis must be placed on promoting retrofits of existing buildings. In many ways, retrofitting the existing housing stock to be more energy efficient is the most difficult and necessary challenge facing local, state, and the federal government. The California Public Utilities Commission has also set the ambitious goal to reduce energy use in existing homes by 40 percent and install low-energy heating and cooling systems in 50 percent of new and existing homes by 2020.[23]

Measure Summary	
GHG Emissions Reduction	5,033
Initial City Costs	$100,000
Cost Effectiveness	$20/metric ton

One simple but effective way to promote energy efficiency of existing buildings is to make residents and business owners aware of the various programs available that defray the up-front cost of energy-efficiency retrofits.

A variety of programs exist to encourage homeowners and renters to upgrade their homes with energy-efficient technology. For example, residents can apply for PG&E rebates on heating, ventilation, and air conditioning (HVAC) equipment, lighting, insulation, cool roofs, energy-efficient appliances, low-income weatherization, and so forth. In addition to rebates, residents can take advantage of federal tax credits, such as the 30 percent tax credit on efficiency upgrades, up to $1,500. These rebates and credits make energy efficiency very attractive, because they greatly reduce the payback period, after which the renter/owner starts saving money they would have otherwise spent on energy.

Unfortunately, often times residents are not aware of these benefits and as such do not take advantage of them. This also means they are not benefitting from programs that will save them money over the long run. This measure is meant to raise public awareness of these benefits though public outreach and education. Actions taken by the City could include:

[23] California Public Utilities Commission, *California Long Term Energy Efficiency Strategic Plan: Achieving Maximum Energy Savings in California for 2009 and Beyond* (2008).

- Outreach to multifamily and large residential building owners to gain economies-of-scale savings and retrofittings' efficiencies
- Public awareness campaigns, including posters, advertisements in the City paper, mailers, radio, and local TV
- Free classes for residents and local businesses to educate people about the value of retrofitting homes and businesses for efficiency
- A hotline to a city staff person who can answer questions related to efficiency opportunities
- Provide an easy to read website linked to the City's main page describing energy-efficiency rebate opportunities
- Start an affiliate of Rising Sun Energy Center. Rising Sun Energy Center operates in Oakland and surrounding cities and trains young adults (ages 14-22) to offer free energy-efficiency services to households. From 2000 to 2005, they helped improve the efficiency of 6,500 households, with resulting savings of $100,000 and 475 metric tons of CO_2 annually.

Photo: Rising Sun Energy

For information on marketing energy-efficiency programs, see the recent Lawrence Berkeley National Laboratory report "Driving Demand for Home Energy Improvement."[24]

GHG Reduction: We assumed approximately 3,000 households (approximately 33 percent of households) would take advantage of some aspect of the various energy programs and incentives by 2020 due to this program. We also assumed approximately 500 businesses would take advantage of rebate programs due to this program. We also conservatively assumed that the total savings due to this program would be 10 percent. According to CAPPA, the total GHG savings would be 5,033 metric tons of CO_2e.

[24] http://eetd.lbl.gov/EAP/EMP/reports/lbnl-3960e-web.pdf

Costs and Savings: City costs could include developing and implementing a public awareness campaign, coordinating with PG&E to offer energy-efficiency classes for large land/building owners and residents, coordinating with Rising Sun Energy to start an affiliate, and setting up the City's energy webpage. We estimate these start up expenses at $100,000.

Residents and businesses would see significant energy and dollar savings in less than a year for some measures, such as lighting, and in less than five years for other measures, such as large appliances. CAPPA estimates that the annual savings for residents and businesses could be $1.5 million per year by 2020. The City could also experience a significant jobs benefit, as energy-efficiency spending bolsters local green collar jobs. Rising Sun Energy has demonstrated in other cities that it can provide low-income youth with valuable job experience and a decent wage.

4.1.2 Goal E-2: Increase Renewable Energy

On-site renewable energy systems offer another important lever for reducing emissions. Generally, renewable energy systems should be installed only after all cost-effective efficiency measures have been implemented. The best options for Bay Area residents are solar hot water heating and roof-top photovoltaic (PV) systems. The largest barrier to on-site renewable energy is high up-front financing costs and long cost-recovery periods. PG&E and the State of California offer incentive programs that help defray the initial investment of energy systems. Starting in 2011, PG&E will be required to pay their customers for the excess energy they generate from on-site solar systems.

To encourage on-site renewable energy, one common strategy employed by other local governments is to offer expedited permitting procedures for renewable generation and green buildings. In the City of East Palo Alto, however, permits are already processed in a relatively short timeframe. Therefore, the recommended actions for meeting the goal of increased renewable energy-use focus on financial assistance and education to interested property owners.

4.1.2.1 Measure E-2.1: Participate in and promote PACE Program

Measure Description: Many barriers exist to reducing energy consumption and increasing the use of renewable energy. One is a high first cost (the up-front cost), which is both a psychological and financial barrier for many people. PACE stands for Property Assessed Clean Energy. It is a generic name for an innovative approach to financing energy efficiency and distributed renewable energy through local governments. These programs allow property owners to finance renewable energy installations, such as PV systems, and energy efficiency retrofits to be paid back through property tax bills. The cash is supplied by the local government organization that administers the program. Typically governments raise money for the program through low-interest municipal bonds.

Measure Summary	
GHG Emissions Reduction	3,914 metric tons
Initial City Costs	$50,000
Cost Effectiveness	$13/metric ton

Loans are typically amortized over 20 years. To receive funding, the property owner submits an application to the municipality, whose staff reviews the scope of work and checks that the property owner has a clear property title. After the municipality approves the application, the work is completed, a lien is placed on the property, and a check is issued to the property owner. A special tax is added to future property bills. If the property is sold before the end of the 20-year repayment period, the new owner pays the remaining special taxes as part of their property's annual tax bill. The interest component of the special tax payments will be tax deductible, similar to a home equity line or home mortgage. The special tax bond is backed by the liens on participating property owners' homes.

In California, PACE programs were authorized throughout the State by AB 811. AB 811 provided local governments with the authority to start clean-energy financing programs. The cities of Berkeley and Palm Springs became early leaders, providing millions of dollars to residents for clean-energy and energy-efficiency retrofits.

CaliforniaFIRST is a program designed to bring municipal clean-energy financing statewide. The CaliforniaFIRST Program will be established at the county level, based upon program approval from the county and local city governments. Applications are not currently being accepted.

Pilot counties and cities have been awarded $16.5 million in funds from the California Energy Commission's State Energy Program. Local education, outreach, and additional services will be provided through the funding, as well as an interest rate buy-down for early program participants. San Mateo County and East Palo Alto are pilot communities for CaliforniaFIRST Program.

However, on July 6, 2010 the Federal Housing Finance Agency (FHFA) issued a statement expressing that senior PACE liens are in violation of their standard mortgage contracts. In response to the FHFA statement, most PACE programs throughout the country have been placed on hold, pending resolution; as a result, **the PACE financing component of the CaliforniaFIRST Energy Retrofit Financing Program is also on hold** until further clarification is provided.

GHG Reduction: Assuming PACE programs are eventually allowed to proceed, we believe that a well-run, well-advertised program could provide 2,000 homes with loans for energy-efficiency loans and 1,000 homes with loans for PV panels by 2020. Assuming the average savings for each home is 25 percent and assuming the average PV installation is 6kW, CAPPA calculates and emissions reductions of 1,365 metric tons for the efficiency loans and 2,549 metric tons for the solar loans for a total of 3,914 metric tons of CO_2e reduced.

Photo: Wayne National Forest via Flickr

Costs and Savings: Initial city costs are minimal since the CaliforniaFIRST Program is funded by American Recovery and Reinvestment Act money. We estimate $50,000 for public outreach, coordination, and support for residents. Residential savings over time can be quite substantial. CAPPA calculates an annual energy savings of $1,576,800 due to solar installations and $555,176 in annual energy cost savings due to efficiency. There is also a significant jobs benefit due to the increased local spending on energy retrofit and solar installation services.

4.1.2.2 Measure E-2.2: Educate residents about solar PV and hot-water system installation

Measure Summary	
GHG Emissions Reduction	300
Initial City Costs	$50,000
Cost Effectiveness	$166

Measure Description: Many homeowners are not aware of the various funding and incentives available to defray the first cost of solar installation. Therefore, the City can actively promote and encourage citizens to install solar PV and solar hot-water systems for their homes. Residential building owners may not be aware that funding is available for the installation of solar PV systems; on low-income single-family and multifamily housing is available through the California Solar Initiative's Multifamily Affordable Solar Housing (MASH) and Single-Family Affordable Housing (SASH) Programs. Also, City residents can be overwhelmed with the complexity of the process, including choosing a system, working with contractors, and dealing with financing. In this measure, the city would work to overcome these barriers by actively promoting renewable energy systems, providing technical support, and reaching out to multifamily building owners to encourage solar-system installations.

This measure is meant to make the public aware of the benefits of solar and provide guidance through the buying and installation process. Actions taken by the City could include:

- Public awareness campaigns, including posters, advertisements in the City paper, radio, mailers, and local TV.
- Free classes for residents and local businesses on solar
- A hotline to a city staff person who can answer questions related to solar questions
- A solar website

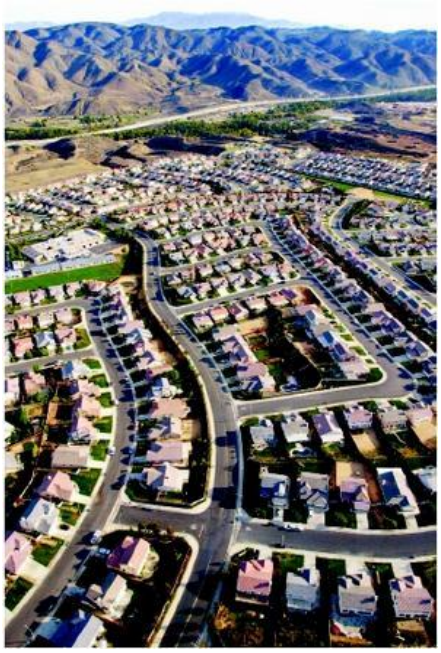
GHG Reduction: We assumed that this program could encourage the installation of 10 new solar systems per year. With an average of 6 kW per installation, or 60kW per year, by 2020 CAPPA estimates that this program could result in 300 metric tons of CO_2 reduced per year.

Costs and Savings: If this program is developed in conjunction with Measure E 1.4, we believe the incremental cost for the solar component to be minimal. For cost-benefit purposes, we estimate initial city costs not to exceed $50,000.

4.2 Transportation and Land Use

According to the ARB Scoping Plan, 38 percent of the state's GHG emissions stem from transportation— the cars and trucks that move people and goods throughout the state. In East Palo Alto, 14 percent of emissions stem from travel on local roads and 48 percent of emissions stem from state highway travel. Thus, reducing the carbon intensity of transportation is a critical component of the climate action strategy.

Reducing emissions from the transportation sector requires addressing three constituent components: fuel carbon intensity, vehicle efficiency, and vehicle miles travelled (VMT). Fuel carbon intensity is addressed by the State of California's Low Carbon Fuel Standard, which mandates that a 10 percent overall reduction in the carbon intensity of transportation fuels (gasoline, diesel, natural gas, electricity, and so on) by 2020. Vehicle efficiency is addressed by AB 1493; California's Clean Cars Law of 2002 (AB 1493) requires carmakers to reduce global-warming emissions from new passenger cars and light trucks beginning in 2009. First in the world to reduce global-warming pollution from cars, this law has now been adopted by 11 other states. Affecting nearly one-third of the U.S. market, global-warming emissions in 2020 will be reduced by more than 64 million tons of carbon dioxide a year.



However, addressing the third component, reducing VMT, is considerably more difficult than the previous two. Californians have driven more and more miles per year over the past five decades. This is attributable in part to following factors:

- Lack of affordability in urban core housing causes people to live far away from where they work
- Lack of viable public transportation options
- Low cost of gasoline
- Sprawl development patterns that do not emphasize density, mixed-use zoning, or transit oriented development (TOD)
- Streetscapes that discourage pedestrian or bicycle access.

In order to reduce VMT and the associated greenhouse emissions, Governor Schwarzenegger signed Senate Bill 375 in 2008. SB 375 sets regional emissions targets and tasks regional

planning organizations to recalibrate land use and transportation planning to meet those emissions targets. This climate action plan seeks to meet the SB 375 targets for the San Francisco Bay Area of 7 percent below 2005 levels by 2020 and 15 percent below 2005 levels by 2035.

The benefits of integrated planning and sustainable development go far beyond simply reducing the GHG emissions that contribute to climate change and its damaging effects. Communities that are well designed provide housing for all income groups and are supported by a range of transportation options that will have many other advantages. Among these are increased mobility and transportation choices; reduced congestion; greater housing choices; improved public health as a result of better air and water quality; natural resource conservation; economic benefits, such as opportunities for neighborhood economic development and lower costs for community infrastructure; reduced dependence on foreign oil; and greater equity through the provision of improved access to jobs, housing, and everyday needs.

As a completely built-out city, East Palo Alto is fully committed to providing diverse transportation options that are convenient, safe, and affordable. Although most East Palo Alto neighborhoods are not likely to change significantly during the next 10 to 15 years, they will not remain entirely static either. Policies proposed in this climate action plan strive to maintain a quality environment that is environmentally and economically sustainable. These priorities and commitments are reflected and incorporated in this chapter on transportation and land use.

4.2.1 Goal TL-1: Prioritize Smart Growth Land Use

As part of SB 375 compliance, regional planning organizations, such as the Bay Area's Metropolitan Planning Organization, are encouraging local governments to incorporate the tenets of "smart growth" in their general plans. Smart growth community planning is a concept that encourages dense development, promotes walkable neighborhoods, preserves open space, and provides a variety of transportation choices. Dense developments tend to have lower transportation related emissions because public transportation, walking, and bicycling are favorable options compared to personal automobiles. The following measures are intended to promote a development pattern in East Palo Alto that encourages lower or no carbon transportation.

4.2.1.1 Measure TL-1.1: Coordinate Climate Action Plan with General Plan to streamline projects that meet the following land use criteria: increase density, affordable housing, transit-oriented development, and mixed-use zoning

Measure Description: Development in the City of East Palo Alto is governed by the General Plan. The General Plan is made up of a number of elements including a housing element, land element, and a circulation element. These elements establish the policies and direction that dictate where and how the City will grow. As discussed in Section 2.4.2, a qualified climate action plan can be coordinated with the General Plan such that development projects that work towards meeting emissions targets can enjoy a streamlined CEQA process. This coordination will have the effect of encouraging the right kinds of development described herein.

Measure Summary	
GHG Emissions Reduction	7,353
Initial City Costs	$250,000
Cost Effectiveness	$34

According to the Bay Area Air Quality Management District's "California Environmental Quality Act Guidelines: Proposed Thresholds of Significance" document released in May 2010:

> *Staff recommends that if a local jurisdiction can demonstrate that its collective set of climate action policies, ordinances and other programs is consistent with AB 32 and State CEQA Guidelines Section 15183.5, includes requirements or feasible measures to reduce GHG emissions and achieves one of the following GHG emission reduction goals, the AB 32 consistency demonstration should be considered equivalent to a qualified Greenhouse Gas Reduction Strategy*:
>
> ► 1990 GHG emission levels,
>
> ► 15 percent below 2008 emission levels, or
>
> *Qualified Greenhouse Gas Reduction Strategies that are tied to the AB 32 reduction goals would promote reductions on a plan level without impeding the implementation of GHG-efficient development, and would recognize the initiative of many Bay Area communities who have already developed or are in the process of developing a GHG*

reduction plan. The details required above for a qualified Greenhouse Gas Reduction Strategy (or similar adopted policies, ordinances and programs) would provide the evidentiary basis for making CEQA findings that development consistent with the plan would result in feasible, measureable, and verifiable GHG reductions consistent with broad state goals

In order to encourage projects that help the City achieve its emissions goals, this measure would do the following:

- Confirm with BAAQMD this climate action plan such that it meets the criteria of a "qualified Greenhouse Gas Reduction Strategy." If not, update the CAP so that it achieves qualified status.
- Adopt the climate action plan in a public process following environmental review, which may include a negative declaration or environmental impact report (EIR).

The types of development that help achieve emissions reductions goals include:

Density – Increasing density means increasing the number of housing units per square mile, especially near transit stations. Policies that increase density achieve the following objectives:

- Encourage infill and development in areas with existing infrastructure
- Increase opportunities for redevelopment/reuse (e.g., brownfields)
- Increase residential/commercial density near transit (e.g., transit-oriented developments)
- Increase use of compact building design in new and existing developments

The General Plan currently calls for amending the zoning ordinance to allow density up to the maximum level allowed by the General Plan.

Affordable Housing - An important aspect of smart growth is allowing people to live in close proximity to their places of work. Today, too often people are forced to commute long distances to reach their places of employment, causing road congestion, air pollution, and GHG emissions. This is an especially vexing problem for the Bay Area, where sky-high rents and mortgages force working families to live far away from places of employment. For East Palo Alto, this is a difficult problem as well. In 2006, there were 8,108 employed residents but only 2,847 jobs located in East Palo Alto. This resulted in an estimated jobs-to-employed-residents imbalance of approximately 0.35 jobs per employed resident, as compared to San Mateo County's almost perfect ratio of 1.01 jobs per employed resident. Therefore, a critical step

would be to allow more mixed uses of land, where commercial and residential spaces can exist in the same building, and to provide enough affordable housing that workers can live close to their jobs.

Transit Oriented – Projects that are co-located with existing transit infrastructure, such as bus and train stations. The General Plan currently calls for working with SamTrans to improve local transit and encourage ridership. The City is also looking to work with MTC, SamTrans, and Caltrans to develop new regional public transportation facilities.

Mixed Use – Projects that mix residential and commercial land uses. In many cases, this requires rezoning. East Palo Alto's Draft Housing Element indicates, "To encourage mixed-use and high-density residential development within East Palo Alto, the City will evaluate development standards and identify rezoning opportunities along University Avenue in order to increase mixed-use development opportunities along the corridor." Furthermore, the General Plan aims to diversify land use and create an economic development strategy that targets desired business and industries for the City to promote City of East Palo Alto as a place to do business and work.

GHG Reduction: ARB staff has adopted per capita GHG reductions of 7 percent by 2020 and 15 percent in 2035 for the San Francisco Bay Area through regional land use and transportation strategies. In 2005, East Palo Alto reported approximately 89,000 metric tons of transportation-related emissions from a population of approximately 32,000 people; that equates to 2.78 metric tons per person. Reducing that number by 7 percent would equal 2.59 metric tons per person. Assuming the 2020 projected population of 38,700, the emissions reduction associated with a 7 percent decrease in per capita transportation emissions would be the baseline emission (2.78 x 38,700 =107,586) minus the climate action plan emissions (2.59 x 38,700 =100,233). The estimated emissions reduction required is therefore 7,353 metric tons of CO_2e.

Costs and Savings: Costs for implementing a smart growth policy are difficult to determine at this time. City costs would include completing an environmental review of this climate action plan. The City also may wish to expand on the CAP written here to provide developers more specific guidance on desired land-use priorities. For professional services and staff time, we estimate $250,000 initial cost for the City.

Costs to businesses and residents are also equally difficult to predict. Redevelopment on infill often contains costs such as brownfield remediation; although U.S. EPA funding is available to encourage these types of developments. Residents may enjoy savings from lower gasoline

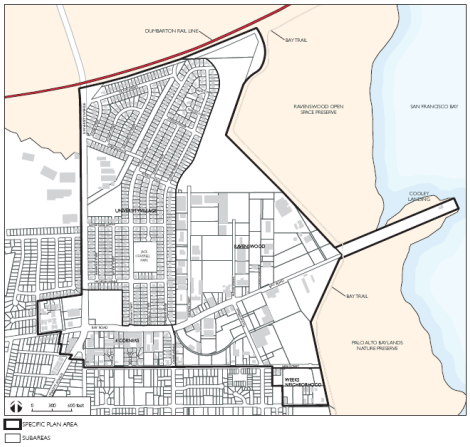
expenditures. Concentrating shops and people in mixed-use zoning may be a boon to the local economy.

4.2.1.2 Measure TL-1.2: Continue to implement Ravenswood/4 Corners TOD Strategy

Measure Description: Transit-oriented developments (TOD) seek to build residences, commercial spaces, including offices and retail, and parks that facilitate transit use. TODs can be very beneficial to a community in that they can provide a myriad of transportation benefits that improve mobility, increase public safety, reduce VMTs, reduce air pollution, and conserve open spaces.

Measure Summary	
GHG Emissions Reduction	6,321 metric tons
Initial City Costs	$0
Cost Effectiveness	<$1/metric ton

In 2008, City of East Palo Alto's City Council/Planning Commission Subcommittee on long-range planning enabled the development known as the Ravenswood/4 Corners TOD. The development is to be centered around the East Palo Alto station on the proposed Dumbarton Rail commuter line, a proposed transit service that would connect Caltrain in Redwood City to BART in the East Bay. According to the October 6, 2010 "Ravenswood/4 Corners Transit Oriented Development Specific Plan: Alternatives Analysis," there are three proposed land uses entitled *Bay Road Focus*, *Mixed-Use Village*, and *Offices by the Bay*. The number of residential units for each of these alternatives varies from 1,075; 1,416; and 898 respectively.



GHG Reduction: CAPPA can estimate the emissions reduction from transportation-related emissions from a TOD development strategy based on the number of residential units built.

- For the *Bay Road Focus* alternative, CAPPA calculates an emissions reduction of 6,321 metric tons of CO_2e.
- For the *Mixed-Use Village* alternative, CAPPA

calculates an emissions reduction of 8,326 metric tons of CO_2e.

- For the *Offices by the Bay* alternative, CAPPA calculates an emissions reduction of 5,280 metric tons of CO_2e.

Because the preferred alternative has not been selected yet, we assume now that the mid-level GHG reduction of 6,321 metric tons of CO_2e would occur under the Ravenswood/4 Corners TOD strategy.

Costs and Savings: There are no additional costs for the City to institute a TOD versus a non-TOD. This measure leverages funding from the Metropolitan Transportation Commission, including federal and state funding for developing the transportation infrastructure.

4.2.2 Goal TL-2: Improve Public Transportation

Increasing public transportation ridership in lieu of personal vehicles is an excellent way to reduce GHG emissions, energy consumption, and traffic congestion. Public transportation can considerably reduce the number of miles driven by all vehicles within a given timeframe and area. Furthermore, public transit can be one of the safest modes of travel, more cost-effective compared to a single passenger vehicle, and an effective strategy for improving air quality and creating strong neighborhood centers.

Photo: SF Weekly

Policies in the East Palo Alto General Plan are consistent with this goal and already promote collaboration with SamTrans and Caltrain to ensure that public transit service remains safe, reliable, and affordable and to improve service frequency and coverage within East Palo Alto neighborhoods and employment centers.

4.2.2.1 Measure TL-2.1: Improve public transportation access to regional transportation and local services

Measure Summary	
GHG Emissions Reduction	88 metric tons
Initial City Costs	$250,000
Cost Effectiveness	$2,841/metric ton

Measure Description: Improving bus service in the City can encourage more people to take public transit in situations where they might have taken a personal car. SamTrans is the county-run bus system that serves East Palo Alto. The East Palo Alto Caltrain shuttle service connects residents in East Palo Alto to the Palo Alto Caltrain station during business commute hours. There is also the East Palo Alto Senior Shuttle, which is free and available to all residents. The shuttle travels through specific locations at specific times,;however, people can also wave their hands for the shuttle to pick them up anywhere along the route wherever it is safe for the driver to stop. All vehicles are equipped with a wheelchair lift and have space for two wheelchairs. Service is provided to various locations on different days. On Mondays and Thursdays, the service goes to Lucky's, Palo Alto Medical Center, and Stanford Shopping Center in Palo Alto. On Tuesdays and Fridays, the service goes to Kaiser Permanente and KMART in Redwood City, and on Wednesdays, the service goes to the San Antonio Shopping Center in Mountain View.

This measure recommends building on the shuttle services already provided, by increasing the service to occur more frequently and to more destinations. An assessment of current needs and a plan to meet those needs is recommended.

GHG Reduction: We assumed that 250 additional daily passengers would take the bus once the route was improved. With a typical trip length averaging 9.8 miles and 230 working days occurring in the year, 563,500 VMTs can be reduced per year.

Even though VMTs from driving less is beneficial, the consequent increase in bus service results in a higher consumption of diesel. We assumed an average fuel economy of 19.7 miles per gallon and calculated 28,604 gallons of gasoline savings per year. The increase in diesel, however, is considerable at 19,604 gallons annually.

With the reduction in VMTs, gasoline savings associated with them, and the increase in diesel use, the net savings were calculated at 88 metric tons of CO_2e per year.

Costs and Savings: In order to improve service, this measure would require providing more drivers and buses along main routes through the City that connect to areas such as the Gateway 101 Shopping Center, Mi Pueblo in East Palo Alto, and to other needed services, such as Kaiser in Menlo Park. Currently, this area is serviced by the Tuesday/Friday, free EPA Senior shuttle. Hiring additional drivers and purchasing one additional shuttle costs an estimated $250,000.

Assuming the price of gasoline at $3.09/gallon, community members could see a savings of $88,000/year. Wear and tear on their cars will also be reduced, which could lead to an additional savings.

4.2.2.2 Measure TL-2.2: Promote education and outreach on pre-tax transit subsides

Measure Description: Pre-tax transit subsidies are a great way to encourage commuters to take public transit in lieu of driving. These types of subsidies can be used for transit passes for SamTrans and CalTrain, and van pool expenses. By providing incentives for their employees, employers can save up to 9 percent on payroll taxes, and employees save up to 40 percent on transit costs.[25] These programs can be self-administered, or a third-party vendor could be hired to facilitate the programs. According to SF Environment, third-party vendors are beneficial in administering these programs for businesses with over 100 employees or multiple locations.

Measure Summary	
GHG Emissions Reduction	382 metric tons
Initial City Costs	$10,000
Cost Effectiveness	$26/metric ton

Education and outreach of such programs to employers as well as employees in the City of East Palo Alto can help reduce emissions associated with transportation. Outreach can be done in the following ways.

- Marketing to the general public and transit users

[25] http://www.tranben.com/assets/sf_commuter_benefit_ordinance_factsheet.pdf

  - "Bug your boss" campaigns encourage employees to ask their bosses about commuter benefits, which also bring about awareness of these benefits to the public
  - Station/Vehicle advertising, radio, newspaper inserts

- Marketing to Employers

  - General advertising about computer benefits programs using flyers, posters, websites
  - Direct one-on-one marketing that works with employers to convince them of the value of such a program and helps them set it up

GHG Reduction: According to the Greater Portland Transit District,[26] public transportation in the U.S. reduces carbon dioxide emissions by 6.9 million metric tons. A single commuter switching his or her commute to public transportation can reduce a household's carbon emissions by 10 percent and up to 30 percent if he or she eliminates a second car. One person switching to public transit can reduce daily GHG emissions by 20 pounds, which equals a reduction of 7.63 metric tons CO_2/person/year. We assume that commuter checks alone will not cause widescale transition to public transportation. If the equivalent of 50 people switches to public transportation due to this measure, then the resultant GHG-emissions reduction would be 382 metric tons.

Costs and Savings: This is a relatively low-cost measure. A small outreach and public relations campaign could cost as little as $10,000 if administered by existing City staff. Residents could see significant savings over time, including avoided vehicle expenses and gasoline purchases. According to the Greater Portland Transportation District, the average household spends 18 cents of every dollar on transportation, and 94 percent of this goes to buying, maintaining, and operating cars, an individual's largest expenditure after housing. Individuals who ride public transportation can save on average $9,343 annually based on the July 7, 2010 national average gasoline price and the national unreserved monthly parking rate. On a per month basis, transit riders can save on average $779 per month.

4.2.3 Goal TL-3: Encourage Walking and Bicycling

The vast majority of trips people make are less than a few miles. Therefore, changing the mode of transportation from driving to biking has GHG-reduction and health benefits. Unfortunately, our streets have not been designed with bicyclists' needs in mind until recently. Bicyclists face many dangers from a lack of dedicated bike lanes and dangerously busy streets. Historically,

[26] http://www.gpmetrobus.com/index.php?option=com_content&view=article&id=119&Itemid=226

sidewalks have been an afterthought from city developers, often being too narrow, too long between blocks, or sometimes non-existent. Promoting sidewalk infrastructure that is pleasant and safe to walk on will encourage more people to walk rather than drive for short errands.

4.2.3.1 Measure TL-3.1: Develop a master pedestrian and bicycle plan to promote walkable streets, bike lanes, and increased bike parking

Measure Description: Developing a master pedestrian and bicycle plan that identifies facility improvements enables a city to create an attractive and usable bicycle infrastructure that improves the enjoyment and quality of life for its residents. Implementing safer bike routes as well as pedestrian-friendly streets and pathways can also improve the health of residents and create a stronger sense of community. The City currently has a master plan in place for access to the bay. According to the San Mateo County Bicycle Plan (2000), 4.2 miles of class III routes exist in the City of East Palo Alto. A citywide plan should be developed to lay the foundation for significant enlargement of the bike network that facilitates safer bicycle and pedestrian routes.

Measure Summary	
GHG Emissions Reduction	250
Initial City Costs	$80,000
Cost Effectiveness	$320/metric ton

Some common components of a pedestrian plan include:

- Adequate sidewalks and crosswalks
- Developing wider sidewalks and barriers between pedestrians and traffic, such as trees, planters, or on-street parking, create safety.
- Building small curb radii at intersections that create shorter distances for pedestrians to cross and force turning vehicles to slow down thus increasing safety.
- Using speed humps and traffic circles can also make streets safer for walking
- Building facades and architecture and urban art also make interesting walking environments, which encourage more people to walk.

Some common components of a bicycle plan include:

- Providing ample bicycle parking

- Defining & developing bicycle networks – implement a master plan that adds safer bicycle routes throughout the City to connect residential areas, schools, business and employment centers, parks, and so on.
- Providing better signage for routes, traffic signals that are functional with bicycles, and safer routes that limit vehicular speeds
- Encouraging bicycles and public transit – a combination of the two greatly increases the potential of bicycle use by expanding travel distance, reducing travel time, and increasing flexibility and options of existing public transit systems.
- Having secure bicycle parking at bus stops
- Increasing on-board bicycle capacity on buses

GHG Reduction: We assumed that by 2020, 2,000 weekly trips would be switched from car usage to bicycle usage, and that 200 weekly trips would be switched from car usage to walking. We also assumed that the average trip length for a bicycle trip would be four miles, and the average length of car trip avoided by walking would be one mile. Given the national average fuel economy of 19.7 miles per gallon and the gasoline emissions factor of 0.009413 metric tons CO_2e per gallon, CAPPA calculated an emissions reduction of 250 metric tons per year and 21,645 gallons of gasoline saved.

Costs and Savings: The City would need to pay for the bicycle and pedestrian master plan to be developed. Therefore, we estimate an $80,000 initial investment for the bike plan.

Bike-lane installation costs would be significantly more expensive as part of a special re-striping project. According to Walkinginfo.org,[27] a website of the U.S. Department of Transportation:

> *The cost of installing a bike lane is approximately $3,100 to $31,000 per kilometer ($5,000 to $50,000 per mile), depending on the condition of the pavement, the need to remove and repaint the lane lines, the need to adjust signalization, and other factors. It is most cost efficient to create bicycle lanes during street reconstruction, street resurfacing, or at the time of original construction.*

Residents who bike or walk instead of driving can save significant money. Assuming $3.00 per gallon gasoline, increased biking can save City residents over $67,000 per year in total.

[27] http://www.walkinginfo.org/engineering/roadway-bicycle.cfm

4.2.3.2 Measure TL-3.2: Expand the Safe Routes to School program

Measure Description: The City of East Palo Alto has taken the initiative to start a "Safe Routes to Schools Program" (SR2S) as part of its capital improvement project (CIP). This program will construct sidewalks on several streets to facilitate walking and bike riding to schools by both children and their parents. The current plan includes access to Green Oaks Academy (K-4) and James Flood Magnet School (K-8); however, street improvements can be made for better access to the following schools:

- Costaño Elementary (K-8) – 373 students
- Ravenswood Child Development Center (Pre K: 3-5 yrs)
- East Palo Alto Charter School (K-8) – 468 students

Measure Summary	
GHG Emissions Reduction	61
Initial City Costs	$10,000
Cost Effectiveness	$163/metric ton

GHG Reduction: Assuming that 900 students are covered by SR2S program with 180 school days per year and the average number of miles driven to drop off or pick up a student are three, the SR2S program could result in 0.262 one-way trips reduced/student/day.

Nine hundred students x (.262 one way trip/student/day) x (3 miles) x (180 days/year) = 127,332 vehicle miles reduced/year. Assuming an average of 20 miles per gallon per car would equal a savings of 6,464 gallons of gasoline, which equals a reduction of 61 metric tons of CO_2e.

Costs and Savings: The State of California awarded the SR2S Program $806,850 in 2008. If outside funding is available, we assume any additional costs for expanding the program to be minimal. We estimate a cost of less than $10,000.

4.2.4 Goal TL-4: Increase Urban Green Space

Increasing the urban canopy with a sustained tree planting program reduces the heat island effect and therefore lowers the energy needed to cool East Palo Alto homes and businesses. Trees also sequester carbon dioxide and might offer an opportunity for GHG reduction credits under the Climate Action Reserve's urban forestry protocol. Additional co-benefits include better quality of life for residents and increased property values.

4.2.4.1 Measure TL-4.1: Support efforts to plant trees in East Palo Alto

Measure Description: This measure considers the effect trees have in reducing the urban heat island effect and in extracting carbon dioxide from the air. Trees planted to shade buildings can also directly decrease energy use.

Measure Summary	
GHG Emissions Reduction	378 metric tons
Initial City Costs	$33,600
Cost Effectiveness	$89/metric ton

Through the process of photosynthesis, trees remove carbon dioxide from the atmosphere, use the carbon to form the physical structure of the tree (roots, trunk, branches and leaves), and return the oxygen to the atmosphere. A single mature tree can absorb as much as 48 pounds of carbon dioxide per year. It is estimated that between 660 and 990 million tons of carbon is stored in our urban forests nationally. By maintaining a healthy urban forest, prolonging the life of trees, and continually increasing tree stock, communities can increase their net carbon storage over the long term. Additionally, trees reduce local temperatures (exacerbated by the heat island effect), which reduces cooling-related energy use.

Trees also reduce storm-water runoff, create a more attractive environment, and increase property values. Studies have found that access to trees and natural environments can improve mental and physical health, improve job productivity, and reduce crime.

Through the East Palo Alto Tree Initiative (EPA-TI), the City has already begun a tree-planting program with Canopy (a Palo Alto non-profit organization) and Cal Fire in which more than 1,200 new trees have been planted since 2007. Expanding the tree-planting program, with the addition of 1,500 trees by 2020, in the City of East Palo Alto can further improve the urban environment, increase air quality, provide jobs to youth, and reduce GHGs.

GHG Reduction: According to CAPPA, tree planting would yield 378 metric tons of GHG reduction. This reduction would need to be incorporated in future GHG inventories as a negative emission.

Costs and Savings: According to CAPPA, it costs $224 to plant a tree. Planting 1,500 trees would thus cost $336,000. By spreading that cost over 10 years, the initial cost would be $33,600.

4.3 Waste

While it may not be immediately obvious, reducing the amount of waste deposited into the landfill through material reuse, reduction, and recycling is an important strategy East Palo Alto residents can take to reduce GHG emissions.

When organic material, such as food, wood, paper, or other biologically derived material, is deposited in landfills, it decays in an oxygen-free environment that produces methane (CH_4). Methane is an extremely potent GHG, such that 1 pound of methane is considered to be as powerful as 21 pounds of carbon dioxide. Some landfills capture as much methane as possible and combust it for electricity generation. However, for many landfills, much of the methane leaks to the atmosphere. This methane leakage is the primary source of the City of East Palo Alto's GHG emissions in the waste category.

Greenhouse gas emissions are also associated with product supply chains. Upstream from the consumer, fossil fuel energy is used to extract the raw materials, such as wood, metals, and so forth, from which products are made. Additional energy is needed to manufacture consumer goods in factories. Petroleum is used for the transportation of raw materials to the factory, moving manufactured goods to market, and moving waste from the consumer's curbside to landfills. These emissions do not show up in East Palo Alto's inventory; however, it is good to be aware of them.

Waste reduction and recycling are powerful tools for reducing emissions all along the consumer materials' lifecycle. Reducing the amount of materials required through re-use—for example using canvas bags instead of plastic and paper bags from the grocery store—represents the best opportunity to reduce GHG emissions in a significant way. Recycling represents the second best opportunity to reduce GHG emissions. For these materials, recycling reduces energy-related carbon dioxide emissions in the manufacturing process and avoids emissions from waste management. The U.S. EPA estimates that if a city of 100,000 people with average waste generation (4.5 pounds/day per capita), recycling (30 percent), and baseline disposal in a landfill with no gas-collection system would increase its recycling rate to 40 percent, it would reduce emissions by more than 3,400 metric tons of CO_2e per year.

As East Palo Alto works towards a more sustainable future, waste reduction and recycling will be a key component of a comprehensive strategy. For this climate action plan, we are focusing on goals and measures that address the "Three R's": Reduce, Re-use, Recycle (and compost).

4.3.1 Goal W-1: Promote Material Re-use

The following measures are designed to promote reusing materials in lieu of disposal. Re-using materials can save the consumer money and reduce GHG emissions.

4.3.1.1 Measure W-1.1: Promote and educate community members about the benefits of re-using materials in their homes and businesses

Measure Description: This measure promotes public awareness campaigns and free community workshops with ideas on how to save money and cut down on waste through material re-use. Possible communication outlets include the City website, radio, TV, billboards, and so forth. For more information on local organizations that promote material re-use, go to http://www.recycleworks.org/reuse_center.html

Measure Summary	
GHG Emissions Reduction	5 metric tons
Initial City Costs	$10,000
Cost Effectiveness	$2000/metric ton

GHG Reduction: Assuming 100 pounds of waste disposal are prevented per person per year (a CAPPA default), this measure is estimated to reduce GHG emissions by five metric tons.

Costs and Savings: City costs include organizing the public awareness campaign and working with local waste minimization organizations to set up workshops. We estimate a small campaign and organizing regular material re-use workshops would cost no more than $10,000.

4.3.2 Goal W-2: Increase Recycling

Recycling has significant environmental and economic benefits. It prevents emissions of many GHGs, reduces pollutants, saves energy, conserves resources, and reduces the need for new landfills and combustors. In 2006, Americans recycled 32.5 percent of municipal solid waste, which prevented the release of 52 million metric tons of carbon equivalent—the same as taking 41.2 million cars off the road.

While recycling is important for the safety of our environment, recycling is also a law in California. In 1989, the California Integrated Waste Management Act (AB 939) was passed requiring all California cities to divert 50 percent of their waste from landfills by the year 2000. In 2000, the City of East Palo Alto was diverting 59 percent of its waste from landfill disposal through its successful waste prevention, re-use, recycling, and composting programs.

The following measures are designed to increase the diversion of recyclable materials such as metals, plastics, and paper from the waste stream from East Palo Alto residences and businesses.

4.3.2.1 Measure W-2.1: Incentivize recycling and support multifamily building recycling solutions.

Measure Description: Local governments define the economics of solid waste in their areas. Through their policies, laws, regulations, rate structures, fees, and taxes, local governments can have a tremendous impact on what is "economic" to do in their community. The California Integrated Waste Management Act of 1989[28] challenges local governments to rethink incentives in place for one-way disposal and to redesign their systems to reward and encourage waste prevention, reuse, recycling, and composting.

One of the most powerful incentives is tax, fee, or cost avoidance. Local governments may adopt many of these tools at little or no cost. The primary cost may be in the preparation and adoption of these tools and subsequent monitoring of their outcomes.

Measure Summary	
GHG Emissions Reduction	274 metric tons
Initial City Costs	$50,000
Cost Effectiveness	$182/metric ton

Pay-As-You-Throw: The U.S. EPA, the California Integrated Waste Management Board, and many others have documented that "pay-as-you-throw" programs can have a major impact on decreasing wastes. This policy increases the cost of landfill waste bins but does not increase the cost of the recycling and green bins (or makes them free if they are not already). This approach would offer the largest increase in tonnages for recycling, and cost impacts are small since behavior changes accordingly. Pay-As-You-Throw rates also increase yard waste

[28] (AB 939, Sher, Chapter 1095, Statutes of 1989 as amended [IWMA])

recycling tonnages and encourage residents to think before they buy products. This prevents waste generation (the cheapest waste management strategy). In a comprehensive study for the Solid Waste Association of North America, Skumatz Economic Research Associates found that such "variable rate" programs can lead to an additional 8 to 13 percentage points of diversion, even if communities already have mandatory curbside recycling and diversion programs.

For more information on pay-as-you-throw, see

- http://www.epa.gov/epawaste/conserve/tools/payt/timeline.htm
- http://www.calrecycle.ca.gov//ReduceWaste/UnitPricing/

Multi-family Recycling

Establishing a recycling program for residents of multi-family dwellings (MFDs) poses a challenge for many communities. Forty-two percent of East Palo Alto residences are in MFDs. MFD residents can generate a large amount of a community's residential waste, and they often desire curbside recycling collection. Yet, these residents are frequently left out of community curbside recycling programs because:

- Curbside programs for individual households are not suited to MFDs. Many MFD buildings were not designed with recycling in mind. MFDs typically have little space in individual units and in common areas for the collection and storage of recyclables.
- Private waste haulers, not local governments, typically provide waste management services to MFDs. Therefore local government may have limited leverage over the waste hauler's policies.

There is no single model for a successful MFD recycling program. Variations in building size, layout, resident characteristics, landscaping, and trash disposal systems require unique arrangements to suit specific sites. For example, some MFD recycling programs collect both recyclables and yard debris. Others collect only recyclables. Some require residents to deliver materials to a central location. Others provide collection from doorways or at curbs. In general, successful programs provide residents with the convenience of curbside collection while fitting into existing waste management systems.

Instituting an MFD recycling program requires planning and continual follow-up. Typical program elements include:

- Waste and site assessments
- Identifying and enlisting participation of key players
- An outreach and education plan
- Determining what materials to collect
- Designing a collection system
- Monitoring progress and providing feedback to program participants

Communities can develop programs that encourage resident and management recycling and provide assistance with program design and education. In many cases, the city can communicate to apartment management that it can often reduce its total solid waste management costs if residents recycle enough to reduce the trash container size or collection frequency.

This measure recommends instituting a multi-family recycling and composting (green bin) strategy to promote full adoption of recycling in all East Palo Alto MFD units.

GHG Reduction: According to CAPPA, instituting a pay-as-you-throw program results in an average waste reduction of 300 pounds per person per year. For a city of East Palo Alto's size, this equates to a GHG emissions reduction of 248 metric tons.

There are 6,658 households in East Palo Alto as of 2007. The Draft Housing Element expects that number to increase to 9,660 households by 2020. If 42 percent of residences are MFDs, there will be 4,057 MDFs in 2020. Assuming there are four persons per household, 16,228 persons will live in MDFs in 2020. According to the GHG inventory, East Palo Alto residents and businesses land-filled 18,410 tons of trash in 2005. That is 1,144 pounds per person per year. Assuming 50 percent of this per person waste calculation can be diverted (572 pounds), CAPPA estimates an additional 26 metric tons of GHG reduction.

Costs and Savings: Costs for establishing a pay-as-you-throw program would be primarily administrative. Significant outreach efforts would be required to encourage community recycling. Typical costs for MFD recycling services can include those for equipment, labor, transportation, contracts, education, advertising, and administration. Tip fees are also a cost. Some communities require contracted and/or franchised haulers to provide equipment and conduct outreach efforts. Revenues from the sale of recyclables and avoided disposal costs can often offset program costs and result in savings. Communities using contractors can gain

savings by negotiating reduced contract costs or by structuring a payment system whereby they pay their contractors less per ton for recycling than trash.

Residents are likely to be resistant to increases in garbage rates. Making sure residents are aware that they can downsize their garbage cans for a lower rate is an important part of the public outreach aspect of this measure.

For program design and initial implementation, the total estimated initial city costs are $50,000.

4.3.2.2 Measure W-2.2: Institute a mandatory requirement for businesses to recycle

Measure Description: An East Palo Alto ordinance could be based on the City of San Francisco and Seattle's mandatory recycling and composting ordinances. Such an ordinance would require East Palo Alto businesses to separate recyclables, compostables, and trash and participate in recycling and composting programs. Property managers of multi-family units would be required to provide adequate recycling containers and service for all of their units or face fines.

Measure Summary	
GHG Emissions Reduction	30 metric tons
Initial City Costs	$50,000
Cost Effectiveness	$1667/metric ton

The ordinance could require businesses to develop recycling plans. For example, in 1991 Pittsburg, California became one of the first communities to adopt an ordinance that required businesses to submit a simple recycling plan and site plan with their annual business tax reports. A city provides a commercial recycling handbook for businesses to use in developing their plans. The handbook includes suggestions on how to develop successful recycling programs and lists local recycling centers and recycling companies. The existing building inspection program is used to enforce the ordinance.

Some communities have required that businesses source separate designated recyclable materials. Often these requirements are coupled with others stating that haulers must provide recycling collection services for those designated recyclable materials.

San Diego County is the best example of this approach in California. In June 1991, the San Diego County Board of Supervisors adopted a mandatory recycling ordinance. The ordinance prohibited mixing designated recyclables with refuse prior to refuse collection. The county introduced surcharges in phases up to a maximum of $100 per load of solid waste delivered to a county landfill. The San Diego ordinance included enforcement by disposal bans on specific recyclable materials (e.g., newspaper, glass, and yard waste). The county phased in the bans over a three-year period.

Many programs enforce their ordinances by issuing tickets and levying fines (heavier for multiple infractions). For example, Kane County, Illinois conducted extensive inspections at businesses to enforce its recycling ordinance. The county charged violators between $25 and $100 per day.
Other creative municipal approaches to enforcement include:

- Requiring businesses and others to set out regular trash in transparent plastic bags for purposes of spot inspection and enforcement. Bags containing recyclables are not picked up. (Nineteen counties in New York State, plus the City of Cheektowaga and Village of Hamburg, use this method.)

- Placing brightly colored stickers on garbage containers filled with recycling. In Durham, North Carolina, the stickers say: "Recycle These Items. It's the Law. Penalties Involved."

- Issuing written warnings. Connecticut's state inspectors cite haulers at a waste-to-energy plant in the Litchfield area if they mix recyclables with trash. The plant is a consortium effort between 14 towns.

- Refusing to collect trash unless a recycling bin is also set out. (Practiced in Abington, Massachusetts).

GHG Reduction: In East Palo Alto, residents and businesses land-filled 18,410 tons of trash in 2005. That is 1,144 pounds per person per year. According to CAPPA, if this measure increased business worker and customer diversion rate by 25 percent, it would mean 286 fewer pounds of materials in the landfill. For a City of East Palo Alto's size, this means a mandatory recycling ordinance would reduce emissions by 30 metric tons.

Costs and Savings: San Diego County allocated $250,000 for an aggressive promotion and education campaign during the implementation of its mandatory recycling ordinance. The campaign included public briefings, workshops on recycling education, and enforcement techniques for cities, recycling collectors, and haulers. The county also introduced technical

assistance program (TAP) grants for public and private entities to expand recycling opportunities in the county. East Palo Alto could embark on a similar campaign on a much smaller scale. We estimate an initial investment of less than $50,000.

4.3.3 Goal W-3: Increase Composting

Composting is a management option for food discards, yard trimmings, and other biogenic materials that significantly reduces the generation of methane in landfills. U.S. EPA researchers believe that well-managed compost operations usually do not generate methane, because they typically maintain an oxygen-rich environment. The EPA also found that composting results in carbon storage, meaning carbon dioxide is effectively removed from the atmosphere, of approximately 0.05 metric tons of CO_2 per ton of organics composted and applied to agricultural soil.

Photo Credit: Kessner Photography via Flickr

4.3.3.1 Measure W-3.1: Institute a mandatory requirement for businesses to compost food scraps & ban-non-biodegradable food containers

Measure Description: East Palo Alto can pass two ordinances under this measure: one requires businesses within the city limits to sign up for commercial compost service from Recology and the other makes non-biodegradable food containers unlawful. Starting January 1, 2011, Recology will be the solid waste hauling service for East Palo Alto. Recology currently offers an optional compost service for commercial customers. The proposed ordinance would require businesses to subscribe to Recology's commercial compost service. Because businesses would bear this cost in addition to normal garbage-hauling fees, they would be incentivized to divert organic waste to the compost service to reduce garbage-hauling fees. An ordinance requiring biodegradable food containers would reinforce the composting ordinance for establishments where food is sold because containers and food scraps could enter the compost stream without further sorting.

Both ordinances would require a one- to two-year lead-time before coming into full effect to allow businesses to understand the rules and prepare for compliance.

Because the City would leverage Recology's program, direct costs to the City would consist of communication, outreach, education, and enforcement of the ordinance. Recology is a natural partner for communication, outreach, and education, because they would have an interest in providing additional services for East Palo Alto businesses. Fines for non-compliance may present a small revenue source to help offset costs to the City.

Measure Summary	
GHG Emissions Reduction	75 metric tons
Initial City Costs	$50,000
Cost Effectiveness	$667/metric ton

GHG Reduction: We assumed that commercial disposed waste is 49.5 percent of total solid waste and that organic matter is 30.4 percent of commercial solid waste per the 2008 California Statewide Waste Inventory. Given the population and solid-waste disposal rate for East Palo Alto, we estimate that this measure would save 168 pounds/person/year of land-filled waste. According to CAPPA, that would prevent 75 metric tons of GHG emissions.

Costs and Savings: City costs are assumed to be equivalent to Measure MU-2.1.

4.4 Municipal Operations

The East Palo Alto climate action plan is meant to be a comprehensive plan encompassing both community and municipal government actions to reduce GHG emissions. While municipal operations constitute a small fraction of the total inventory, municipal action can help reduce operation costs and has important symbolic value by demonstrating leadership that extends beyond the magnitude of emissions actually reduced.

In this chapter, we briefly summarize the goals and describe each measure in Table 7. The goals include increasing energy efficiency and renewable energy and the number of efficient city vehicles, and transforming into a zero-waste government. These are actions the city should evaluate in order to become a more sustainable enterprise.

4.4.1 Goal MU-1: Increase Municipal Energy Efficiency and Renewable Energy

Greenhouse gas emissions related to buildings and streetlights comprise eight percent of East Palo Alto's total government operations emissions inventory. Recommended measures for consideration include:

- **MU-1.1: Retrofits of all traffic signals, pedestrian walk signs, and streetlights with LED lights.** Streetlighting is often one of the largest items in a local government's energy budget. Many cities still have older, inefficient, mercury-vapor lamps or incandescent bulbs in street lights. Light-emitting diodes (LEDs) have been used to successfully reduce energy use for traffic signals, and some cities are now choosing expanding their use to save energy from street lights. LEDs are highly efficient, and their light is directional, making it easy to focus them on roads, avoiding ambient light pollution and energy waste. LEDs produce better light quality than sodium lamps and provide better visibility of colors. Perhaps the most attractive feature of LEDs for local governments is the maintenance savings from their long life—10-12 years in streetlight applications. PG&E has a rebate program available to municipal governments to help offset the first cost of streetlight retrofits.[29]

- **MU-1.2: Energy efficiency retrofits for city buildings.** The City of East Palo Alto should contract with an energy-audit firm to perform an analysis of all the energy efficiency opportunities in City owned and occupied buildings. Once the assessment is finished, the City should implement all measures with a 10-year or less payback. At a minimum, buildings should be retro-commissioned to ensure that they are operating at their maximum efficiency.

- **MU-1.3: Install solar panels on city owned buildings/land.** The City should investigate solar panel opportunities for City-owned buildings and land. Various incentives, such as a federal tax credit, California Solar Initiative funding, net-metering agreements, and feed-in tariffs, may make solar installations attractive economically. In the long term, it will save the City money because it protects against future PG&E rate increases.

29 http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/ref/lighting/lightemittingdiodes/streetlightprogram.shtml

4.4.2 Goal MU-2: Efficient Municipal Transportation

City fleet operations comprise 29 percent of the City's emissions inventory. The City fleet encompasses necessary vehicles ranging from police cars to maintenance trucks to forklifts that all serve important jobs to keep the community safe, clean, and attractive.

Measures and actions for consideration include:

- **MU-2.1 Promote an efficient city fleet policy.** Following the City of Berkeley model, the City may consider replacing two to three City fleet vehicles with one hybrid or electric vehicle from a car-share company.[30] Also, the City should replace fleet cars with hybrids or electric vehicles on an ongoing basis, whenever feasible. The City should consider retiring underused and inefficient City fleet vehicles**.** It may also consider a usage analysis policy to assess the operating costs and annual mile usage of each vehicle to compare costs per mile of each fleet vehicle. These types of metrics can provide information to ensure cost-effective and reduced GHG emissions related to fleet operations. The City should evaluate the vehicle maintenance routines to make sure all vehicles have proper tire pressure and encourage slower, smoother driving practices for more fuel efficiency.

4.4.3 Goal: MU-3 Work towards Zero Waste Government Operations

Waste generated through City offices, landscaping, and construction projects comprise 17 percent of the City's total municipal emissions inventory. Actions to reduce waste and increase waste diversion in municipal buildings and operations demonstrate important leadership to the community.

- **MU-3.1: Provide recycling and compost (food scrap) bins in all City buildings. Post signs above bins to promote correct waste disposal.** Make sure all City buildings have recycling bins for at least glass, plastic, paper, and cardboard as well as food-scrap compost bins. Posting a large instruction sign above each set of bins will help employees properly dispose of waste.

- **MU-3.2: Minimize waste generation through behavior change.** The best waste reduction strategy is to not produce the waste in the first place. A number of easy behavior changes can be promoted within the City's organization such as:

[30] Other cities have joined local car-sharing agencies and encouraged staff to use the vehicles, but Berkeley has contracted to develop vehicle reservation software that dedicates the vehicles for City employee use during the work week and enables general members to use the vehicles on evenings and weekends.

- Making double-sided printing the default on all computers. Encourage printing two pages per sheet.
- Providing reusable canvas bags to city employees to cut down on plastic and paper bag use
- Providing plates and silverware for employee lunches instead of using disposable plates and silverware.

4.4.4 Summary of Municipal Operations Goals and Measures

For each of the above described measures, we ran the CAPPA tool to determine GHG reductions, cost, and long-term savings. The results are presented below in Table 7.

Table 7: Summary of Municipal Operations Goals and Measures

Goal	Measure	GHG Reduction (metric tons)	Cost Range	Cost Effectiveness ($/metric ton)
MU-1: Increase Municipal Energy Efficiency and Renewable Energy	MU-1.1: LED retrofits of traffic signals and streetlights	111	$100,000 - $1,000,000	$901 - $9,009
	MU-1.2: Energy efficiency retrofits for city buildings	86	$25,000 - $100,000	$290 - $11,628
	MU-1.3: Install solar panels on City-owned buildings/land (assume 50kW)	21	$40,000 - $60,000	$1,905 – $2,857
MU-2: Efficient municipal transportation	MU-2.1: Efficient City fleet policy	25 - 50	$20,000 – $100,000	$400 - $4,000
MU-3: Work towards zero-waste government operations	MU-3.1: Provide recycling and compost (food scrap) bins in all City buildings. Post signs above bins to promote correct waste disposal.	<1	$0	<$1
	MU-3.2: Reduce waste generation through behavioral change	<1	$0	<$1

5. Implementation

The preceding chapters describe the principal sources of the City of East Palo Alto's GHG emissions and outline related goals and possible actions for achieving the community's target of reducing emissions to 15 percent below 2005 levels by 2020. The following section details how East Palo Alto's climate action effort can be implemented.

Although significant GHG reduction policies and initiatives are already in place, the actions proposed in this plan, by necessity, far surpass the scale of existing efforts. Implementing the plan and ensuring that it results in real GHG-emissions reductions will require increased coordination across sectors and institutionalized climate protection efforts across the community. Help is available, and funding opportunities are included in Appendix A.

The large number of measures and programs recommended in this plan will take many years to implement, given limitations in both staff time and funding. A cost-benefit analysis and prioritization methodology is presented below to assist the City in developing a phased implementation plan.

This chapter outlines the main components of the process for turning this plan into action and identifies specific actions from earlier chapters that are recommended for implementation.

5.1 Cost-Benefit Analysis

As part of the analysis, KEMA estimated key performance indicators (KPIs) for each measure, including GHG emissions reduction, initial city costs, and cost effectiveness. Based on this information, the measures are scored for the relative environmental and economic impacts of each measure. These KPIs were then used to perform a prioritization scoring using a methodology developed by KEMA and the City. While municipal operations measures did include estimations of GHG reductions, first costs, and cost effectiveness, they were not included in the prioritization scoring. This is due to the fact that by their nature municipal operations measures do not result in significant emissions reductions as compared with community-wide measures, and therefore it is not an "apples-to-apples" comparison.

The prioritization-scoring scheme is as follows:

- **GHG reduction (metric tons CO_2e)** – Measures were analyzed for approximate annual quantity of GHG reductions that could be reasonably achieved.[31]

GHG Reduction	Score
> 1000 $MTCO_2$	3
500 - 1000 $MTCO_2$	2
< 500 $MTCO_2$	1

- **City Costs** – KEMA estimated upfront and first costs to the City to implement the measure. Most measures were related to City programs for the community with no savings directly generated for the City. For the few measures that did result in annual savings to the City, payback periods were generally greater than five years and were qualitatively considered in determining the final score.

City Costs	Score
< $100,000	3
$100,000-$250,000	2
> $250,000	1

- **Cost Effectiveness –** KEMA divided the costs by the emissions reductions to determine cost effectiveness. A lower cost per ton means a measure is very effective at reducing emissions relative to its upfront cost. It should be noted that this metric does not take into account the benefits of measures over time. For example, solar-panel installation has a high first cost, but over time pays for itself in energy savings.

Cost Effectiveness	Score
<$50/metric ton	3
$50 - $250/metric ton	2
>$250 metric ton	1

- **Bonus points** – In recognition of the desirability of certain policies that are not readily quantifiable, bonus points were given for the following:

[31] Emissions Factors utilized: 0.638 lbs CO_2 saved/kWh saved. 0.0053 metric tons CO_2 saved/therm saved. (Source: PG&E public report and The Climate Registry General Reporting Protocol)

- **Jobs benefit** - If a measure has the potential for developing green jobs within the community, it received one bonus point
- **Available funding from outside the City** – If a measure leverages funding from regional, state, or national sources, it received one bonus point

5.2 Results of the Cost-Benefit Analysis

The table below summarizes the high-level results of the cost-benefit analysis and assists in developing the prioritization of actions to assist the City of East Palo Alto achieve its GHG emissions target.

Table 8: Results of Cost Benefit Analysis

Measure	GHG Reduction (metric tons)	GHG Score	City Costs	Cost Score	Cost Effectiveness ($/metric ton)	CE Score	Jobs	Leverages Outside Funding	Total Score
E-1.1: Establish a mandatory green-building checklist such as GreenPoint rated for new home construction and retrofit projects	2,612	3	$100,000	2	$38	3	1	0	9
E-1.2: Establish a mandatory green-building ordinance on all new commercial construction based on CALGreen or LEED	2,078	3	$100,000	2	$48	3	1	0	9
E-1.3 Promote water efficiency	534	2	$50,000	2	$93	2	0	0	6
E-1.4: Leverage existing programs and tax incentives for energy-efficiency audits and retrofits	5,033	3	$100,000	2	$20	3	1	1	10
E-2.1: Participate in and promote PACE program	3,914	3	$50,000	2	$13	3	1	1	10
E-2.2: Educate residents on solar PV and hot-water system installation	300	1	$50,000	2	$166	2	0	0	5
TL-1.1: Streamline projects that meet the following land-use criteria: increase density, affordable housing, TOD, and mixed-use zoning	7,353	3	$250,000	1	$34	3	1	0	8
TL-1.2: Continue to implement Ravenswood/4 Corners TOD Strategy	6,321	3	$0	3	$1	3	1	1	11
TL-2.1: Expand shuttle service	88	1	$250,000	1	$2,841	1	1	0	4

Measure	GHG Reduction (metric tons)	GHG Score	City Costs	Cost Score	Cost Effectiveness ($/metric ton)	CE Score	Jobs	Leverages Outside Funding	Total Score
TL-2.2: Promote education and outreach on pre-tax transit subsidies	382	1	$10,000	3	$26	3	0	0	7
TL-3.1: Develop a master pedestrian and bicycle plan to promote walkable streets, bike lanes, and increased bike parking.	250	1	$80,000	2	$320	1	0	0	4
TL-3.2: Expand the *Safe Routes to Schools* program	61	1	$10,000	3	$163	2	0	1	7
TL-4.1: Support efforts to plant trees in East Palo Alto	378	1	$33,600	3	$89	2	0	0	6
W-1.1: Promote material re-use	5	1	$10,000	3	$2,000	1	0	0	5
W-2.1: Incentivize recycling and support multifamily building recycling solutions.	274	1	$50,000	2	$182	2	0	0	5
W-2.2: Institute a mandatory requirement for businesses to recycle	30	1	$50,000	2	$1,667	1	0	0	4
W-3.1: Institute a mandatory requirement for businesses to compost food scraps & ban non-biodegradable food containers	75	1	$50,000	2	$667	1	0	0	4

Notes:

CE – Cost Effective

GHG – Greenhouse gas

LEED – Leadership in Energy and Environmental Design

PACE – Property Assessed Clean Energy Financing

TOD – Transit-Oriented Development

5.3 Prioritization Methodology

The project scoring resulted in the grouping of the projects into three implementation categories based on their relative scores. The three categories are defined as follows:

- **"Green Light" – High-Priority Actions (Scores ranging from 8 to 10):** Projects that received the highest relative scores and are recommended for high-priority consideration for implementation.
- **"Yellow Light" Medium Priority Actions (Scores ranging from 5 to 7):** The second group of projects considered for funding and implementation with moderate relative scores. These measures are recommended for consideration following the green light measures.
- **"Red Light" Low Priority Actions (Scores below 3 to 4):** These measures may be worthwhile, but are not recommended as high-priority climate action items.

5.4 Community Actions Recommended for Implementation

While short-term priorities are illustrated, please note that priorities can and do shift based on funding availability, advances in technology, new and better ideas, and other reasons. The climate action plan, and this Implementation section, should be considered a living document.

The actions below are "green light" measures and are recommended for high priority in implementation.

- TL-1.2 – Continue to implement Ravenswood/4 Corners TOD strategy (11 points)
- E-1.4 – Leverage existing programs and tax incentives for energy-efficiency audits and retrofits (10 points)
- E-2.1 – Participate in PACE program (10 Points)
- E-1.1 – Establish a mandatory green-building checklist, such as GreenPoint Rated for new home construction and retrofit projects (9 points).
- E-1.2 – Establish a mandatory green-building ordinance on all new commercial construction, based on CALGreen, LEED, or equivalent standard (9 points)
- TL-1.1 Streamline projects that meet the following land-use criteria: increase density, affordable housing, TOD, and mixed-use zoning (8 points)

The actions below are “yellow light” measures and are recommended as medium priority in implementation.

- TL-2.2: Promote education and outreach on pre-tax transit subsidies (7 points)
- TL-3.2: Expand the *Safe Routes to Schools* program (7 points)
- E-1.3 Promote water efficiency (6 points)
- TL-4.1: Support efforts to plant trees in East Palo Alto (6 points)
- W-1.1: Promote material re-use (5 points)
- W-2.1: Incentivize recycling and support multifamily building recycling solutions. (5 points)
- E-2.2: Educate residents on solar PV and hot-water system installation (5 points)

The actions below are “red light” measures and are recommended as low priority in implementation.

- TL-2.1: Improve bus service routes (4 points)
- TL-3.1: Develop a master pedestrian and bicycle plan to promote walkable streets, bike lanes, and increased bike parking. (4 points)
- W-2.2: Institute a mandatory requirement for businesses to recycle (4 points)
- W-3.1: Institute a mandatory requirement for businesses to compost food scraps and ban non-biodegradable food containers (4 points)

5.5 Municipal Operations Measures Recommended for Implementation

KEMA recommends that all municipal operations measures be considered for immediate implementation. That being stated, the reality facing cities in California is one of scarce resources. Therefore, we prioritize the most cost-effective solutions below:

- **Low-cost or no-cost measures should be implemented.** These include "MU – 3.1: expand recycling and composting at city buildings" and "MU-3.1: Minimize waste generation through behavior change."
- **Energy-efficiency measures should take the next priority**. These measures tend to have rebates or other incentives available and pay themselves off in less than 10 years. Following the payback period, the City enjoys costs savings that can be used for other vital City programs. Therefore, the next priority measures are "MU-1.1: LED retrofits of traffic signals and streetlights" and "MU-1.2: Implement energy-efficiency retrofits for city owned and occupied buildings."
- **Finally, the most expensive measures.** These are "MU-1.3: Install solar panels on city owned buildings/land" and "MU-2.1: Efficient Fleet Policy". Installing solar PV systems, despite falling technology prices, tax credits, and rebates, remains an expensive option with a longer payback period than energy efficiency measures.

5.6 Meeting Emissions Targets

Tables 9 and 10 below are restatements of the GHG emissions inventory, projections and reduction targets

Table 9 GHG Emissions Inventory and Projection

Emissions Sources	2005 ($MTCO_2e$)	2020 ($MTCO_2e$)
Residential	24,838	28,618
Commercial/Industrial	23,222	27,200
Transportation	89,045	111,475
Waste	3,360	3,871
TOTAL	**140,465**	**171,164**

Table 10: GHG Emissions Reduction Projection and Target

2005 Emissions ($MTCO_2e$)	2020 Target Emissions at 15% below 2005 ($MTCO_2e$)	2020 BAU Emissions ($MTCO_2e$)	Emissions Reductions Required ($MTCO_2e$)
140,465	119,395	171,164	51,769

According to BAAQMD,[32] the Clean Cars standard will reduce statewide transportation emissions by 19.7 percent by 2020. In addition, the Low Carbon Fuel Standard (LCFS) will reduce transportation emissions by 7.2 percent. The RPS standard is projected to reduce statewide electricity emissions by 21 percent. Therefore, we assumed that they will reduce the City of East Palo Alto's emissions accordingly.

KEY FINDING

The following table takes into account statewide initiatives and shows that the projected emissions reductions from CAP measures would cover the gap to meet the 2020 target.

[32] Bay Area AQMD 2010. *Proposed Air Quality CEQA Thresholds of Significance*

Table 11: Meeting the 2020 Target

State Initiative	% Reduction from 2020 GHG Inventory	Sector	Reduction in City of East Palo Alto's Emissions
AB 1493 (Pavley)	19.7%	Transportation	(21,963)
LCFS	7.2%	Transportation	(8,027)
33% RPS	21%	Energy (Electricity)	(2,668)
A. Total Statewide Initiative Emissions Reductions			32,658
B. City of East Palo Alto Emissions Reduction Requirement			51,769
C. Climate Action Plan Emissions Reduction Responsibility (B – A)			19,111
G. Sum Total of All Reductions Measures			(29,668)
Net Emissions			(10,557)
Meets Target?			Yes

5.7 Community Education and Outreach

A recurring theme in this climate action plan is that the City can play a substantial role in generating awareness and educating residents about ways to reduce emissions. While the City can help initiate a movement that emphasizes sustainable practices, it is crucial that other members of the community, such as residents and small businesses, are engaged in the process in order to achieve the reduction targets mentioned in this plan. The target will only be achieved by building a movement that achieves sustained action and coordination across stakeholders and sectors.

As mentioned previously, there are significant opportunities for the City to leverage existing programs funded by the State of California, PG&E, and others to support community efforts to improve energy efficiency, install renewable energy, facilitate transit/biking/walking initiatives, and other actions that households and businesses can take. The City of East Palo Alto should

make a concerted effort to distribute information more widely on funding opportunities for residents and local businesses. Actions may include more information posted on the City website and marketing materials posted at key locations, including City Hall and libraries. Additional actions may include partnering with PG&E and local water districts to further develop marketing presentations and workshops for the community.

Another potential avenue to get the community involved would be to hold an "eco-fair" annually. These fairs could allow local green vendors to meet potential clients, and the City could provide people with free CFLs and water-saving devices. Residents could also learn about the myriad of energy efficiency, renewable energy, and recycling programs available in the City.

Specific actions that the community can take today are included in Appendix A of this climate action plan.

5.8 Monitoring Progress

Monitoring progress is a critical component of the climate action plan. Whenever funding permits, the City should install a monitoring program, and responsibility should be assigned to a specific department and staff, such as a sustainability coordinator. For each action recommended for implementation, the City will work to define, monitor, and report on measurable indicators of success. Continuous evaluation of GHG-reduction strategies is important to ensure that resources are allocated efficiently to meet City goals for both emissions reductions and other economic priorities.

A number of tools and practices exist that can enable the City to track and report progress toward achieving the goals outlined in this plan, including monitoring the funds allocated to climate-protection goals. Tools can be as simple as spreadsheet tracking sheets developed to monitor estimated annual energy and water savings, waste diverted, and associated GHGs reduced. Fortunately, consistent estimates for electricity and natural gas savings are provided for energy-efficiency measures from the California Energy Commission and California Public Utilities Commission's Database on Energy Efficient Resources (DEER). Other indicators of success may include miles of bike lanes and number of households actively participating in composting and recycling programs.

The below actions are recommended to promote regular, transparent reporting of progress towards meeting the City of East Palo Alto's GHG reduction goal.

- **Hire a Sustainability Coordinator –** The City should hire a permanent, full- time sustainability coordinator to further develop and implement programs and actions and be

responsible for monitoring and reporting progress towards meeting the 2020 emissions-reduction goal. The estimated cost to the City would be $50,000 – $75,000 per year. The Sustainability Coordinator should present a progress report on the Climate Action Plan to the City Council at least annually.

- **Establish an Interdepartmental and Community Based Climate Action Taskforce –** A taskforce with representatives from each city department and interested community groups should be formed to regularly meet in regards to the Climate Action Plan. The group should seek to further define and implement the measures in the CAP as well as drive the update process for the CAP. The task force should also share information regarding State implementation of AB32, SB375, CEQA, and monitor best practices from other City CAP implementation efforts. The meetings should be organized and run by the Sustainability Coordinator. The task force should present their progress at least once per quarter to the City Council.

- **Launch a Climate and Sustainability Website** – The City should develop and maintain a web-based portal that enables the City to effectively and transparently communicate the goals outlined in the climate action plan and progress towards achieving those goals. The evaluation and measurement of annual outcomes related to specific actions may also be published. The website should also provide resources to residents and businesses on cost-effective opportunities to reduce emissions.

- **Coordinate with San Mateo County and the City and Country Association of Governments (C/CAG)** – Greenhouse gas emissions, especially from transportation, are best managed from a regional perspective. The City of East Palo Alto should designate their sustainability coordinator to work with San Mateo County and the C/CAG during their upcoming climate action plan processes, such that the various CAP efforts can be coordinated. In the future, East Palo Alto's CAP can incorporate measures by reference from County or regional CAPs and supplement them with local actions.

- **Track community-wide aggregate emissions** – The City should conduct a GHG emissions inventory approximately three to five years. Measuring GHG emissions on a regular basis is important to verifying that the climate initiatives are effectively reducing emissions and that the appropriate scale of GHG reductions are being pursued.

6. Conclusion

While the challenge of climate change is unprecedented, local-level solutions can reduce emissions, increase efficiency, promote economic development, and improve resident quality of life. The City of East Palo Alto has taken a significant step forward for a more sustainable future with this climate action plan. The plan has identified areas and opportunities to reduce GHG emissions within the community and City operations that along with statewide efforts can achieve our environmental goals. East Palo Alto is poised to reap the benefits of a clean energy economy, with policies that can increase the demand for local green jobs.

These are difficult issues. And what can a single individual do. Appendix B provides 10 ways that individuals can reduce their GHG footprint.

While an important first step, this plan will remain a living document, to be updated as technology and policies progress, to support the City's efforts to manage GHG emissions for a sustainable future for all.

Appendix A: Funding and Resources

For implementation of the Climate action plan, the City must evaluate strategies for financing climate protection actions and provide adequate, reliable, and consistent long-term program funding. This appendix provides an overview of available funding sources to help determine appropriate potential program funding sources and funding levels to support existing and new programs outlined in this plan. Other funding sources may be available that are not listed here.

Federal Funding

American Reinvestment and Recovery Act (ARRA) Loan Program

Low-interest loans (with an interest rate of 1%) are available through the California Energy Commission for municipal energy saving projects. The maximum loan amount is $3 million per application and $20 million to $25 million is currently available. Loans must be repaid from energy cost savings within approximate 13 years simple payback. Eligible projects include improving lighting systems, replacing streetlights or traffic signals LEDs, installing automated energy management systems/controls and building insulation, energy generation including renewable and combined heat and power projects, heating and air conditioning modifications, and upgrading waste-water-treatment equipment. Swimming pools and golf courses are not eligible for funding under this program. All projects financed using this program must be completed and fully disbursed on or before March 31, 2012. Information about this program is available online at http://www.energy.ca.gov/efficiency/financing/index.html.

Federal Transportation Investment Generating Economic Recovery (TIGER) Grant

The Federal Transportation Investment Generating Economic Recovery (TIGER) grant program was created by the American Investment and Recovery Act (ARRA) of 2009. The City has applied for a TIGER grant to fund the new downtown parking garage, which includes an electric battery-swap station and one level of parking for electric vehicles. Information about the TIGER program is available at http://www.dot.gov/recovery/ost/.

State Funding

California Solar Initiative (CSI) - The California Solar Initiative (CSI) is the solar rebate program for California consumers that are customers of the investor-owned utilities - Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E). Together with the rebate program for New Solar Homes and rebate programs offered through the dozens of publicly owned utilities in the state— the CSI program is a key component of the Go Solar California campaign for California.

A solar rebate program for customers in PG&E, SCE, and SDG&E territories, this program funds solar on existing homes, existing, or new commercial, agricultural, government and non-profit buildings. This program funds both solar photovoltaics (PV), as well as other solar thermal generating technologies. This program is sometimes referred to as the CSI general market program.

- A solar hot-water rebate program for customers in PG&E, SCE, and SDG&E territories. This program funds solar hot water (solar thermal systems) on homes and businesses. This program is called the CSI-Thermal program.
- A solar rebate program for low-income residents that own their own single-family home and meet a variety of income and housing eligibility criteria. This program is called the Single-family Affordable Solar Homes (SASH) program.
- A solar rebate program for multifamily affordable housing. This program is called the Multifamily Affordable Solar Housing (MASH) program.
- A solar grant program to fund grants for research, development, demonstration, and deployment (RD&D) of solar technologies. This program is the CSI RD&D program.

The CSI offers solar customers different incentive levels based on the performance of their solar panels, including such factors as installation angle, tilt, and location rather than system capacity alone. This performance framework ensures that California is generating clean solar energy and rewarding systems that can provide maximum solar generation.

The CSI program has a total budget of $2.167 billion between 2007 and 2016 and a goal to install approximately 1,940 MW of new solar generation capacity. The CSI-Thermal portion of the program has a total budget of $250 million between 2010 and 2017, and a goal to install 200,000 new solar hot-water systems. The CSI program is funded by electric ratepayers and the CSI-Thermal portion of the program is funded by gas ratepayers. The CSI program is overseen

by the California Public Utilities Commission and rebates are offered through the Program Administrators.

Single-family Affordable Solar Homes (SASH) Program provides solar incentives on qualifying affordable single-family housing. To qualify for a fully subsidized 1 kW system, homeowners must meet the legal definition of "low-income residential housing" in Public Utilities Code 2852. Eligibility is limited to owner-occupied households that received electric service from the investor-owned utilities (e.g., Pacific Gas & Electric) and whose household income is at or below 50 percent of the area median income (AMI). To qualify for a highly subsidized solar system is determined by household income less than 80% AMI, housing stock eligibility, Federal Income Tax liability, and eligibility for the California Alternative Rates for Energy (CARE) Program.

Multifamily Affordable Solar Housing (MASH) Program provides solar incentives on qualifying affordable housing multifamily dwellings. To qualify for MASH Track 1 or Track 2 incentives, a property must meet the definition of “low-income residential housing” per Public Utilities Code 2852 and have occupancy permit for at least two years prior to applying for incentives. More information about this and the SASH program can be found on the California Public Utilities Commission’s website (http://www.cpuc.ca.gov/PUC/energy/Solar/).

Energy Conservation Assistance Account Program (ECAA)

Projects that are not eligible for funding under the ARRA Loan Program may be eligible for funding through the California Energy Commission’s Energy Conservation Assistance Account Program (ECAA), which offers loans with three percent interest to finance energy-efficiency improvements. Information about this program is available online at http://www.energy.ca.gov/efficiency/financing/index.html.

Utility Rebate Programs

PG&E and EBMUD Residential Appliance Rebates

Pacific Gas and Electric Co. (PG&E) offers rebates to customers who purchase qualifying energy efficient appliances, including dishwashers, hot-water heaters, and room air conditioners. Rebates range from $30 to $75 for qualifying appliances. PG&E and American Water are also currently offering a combined rebate of up to $250 for installing high-efficiency clothes washers. More information on these programs is available at http://www.pge.com/myhome/saveenergymoney/rebates/appliance/

PG&E LED Streetlight Replacement Program

The City of East Palo Alto may be eligible for PG&E's LED streetlight replacement program which provides rebates to cities that replace existing streetlights with more energy efficient LED fixtures (up to $125 per fixture). More information on this program is available at http://www.pge.com/mybusiness/energysavingsrebates/ rebatesincentives/ref/lighting/lightemittingdiodes/incentives/index.shtml

PG&E Commercial Appliance Rebates

PG&E offers rebates to business customers on hundreds of products including refrigeration units, lighting fixtures, heating systems, food service appliances, boilers and water heaters, and insulation. More information and a complete list of products eligible for rebates is available online at http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/ref/index.shtml.

PG&E Home Energy Efficiency Improvements Rebates

PG&E offers rebates to customers who make energy efficiency improvements when remodeling their homes. Currently PG&E offers a rebate of up to $0.20 per square foot for cool roof installations and $0.15 per square foot of attic and wall installation installed. Additionally, PG&E has rebates for homeowners who upgrade their home's heating and cooling systems. Rebates are available for installing energy efficient furnaces (up to $300), air conditioning units (up to $50) and whole house fans (up to $100). Finally, PG&E will provide up to $400 in rebates to customers who test and seal their home's duct system. More information on this program is available at http://www.pge.com/myhome/ saveenergymoney/rebates/remodeling/.

Non-Governmental Organizations

American Forests Global ReLeaf Grant Program

American Forests is a non-profit organization founded in 1875 that promotes forest conservation. American Forest's Global ReLeaf Program provides grants to fund tree-planting projects in urban and natural areas. More information is available online at http://www.americanforests.org/global_releaf/.

California ReLeaf Urban Forestry Grant Program

The California ReLeaf Urban Forestry grant program provides funding to assist nonprofit and community-based groups throughout California with urban forestry projects. The program is funded through a contract with the California Department of Forestry and Fire Protection (CAL FIRE). More information is available online at http://californiareleaf.org/ programs/grants.

Appendix B: 10 Steps to Reduce Your Carbon Footprint

From CoolClimate.org

1. Change your commute

Did you know that one third of the CO_2 produced in the U.S. is from the transportation of people or goods? Pick one day a week to walk, bike, take public transportation or carpool to work or when you are running errands. If possible, live close to your workplace. When driving, remember to combine several car trips into one trip and avoid idling. Additionally, you can get better fuel efficiency by following the speed limit. Exceeding the speed limit by just 5 mph during highway travel results in an average fuel economy loss of 6 percent.

2. Be a better consumer

Did you know that the average American generates about 4.4 lbs of trash each day? To reduce the amount of trash you generate, follow these few easy steps. Use re-usable coffee mugs and shopping bags. If you forget your mug or bag at the store, buy a new reusable mug or bag and keep the extra one in your purse or car for use the next time you are out. Alternatively, set aside $1 each time you forget your mug or bag; depending on your memory, you will have enough funds to purchase a reusable item sooner or later. Also, reuse as many things as possible and recycle at home, work, and school.

3. Shop local

The shorter the distance your food travels to your plate or that product travels to your home, the fewer greenhouse gases are produced. Declare one day a week "Local Day" and eat foods produced within 50 miles of your house.

4. Dry-up Household Water Consumption

Did you know that water-related energy use consumes 19 percent of California's electricity, 30 percent of its natural gas, and 88 billion gallons of diesel fuel every year? To reduce your water consumption at home, turn off your water when it's not being used, take shorter showers, stop unseen leaks by reading your meter, install low-flow shower heads and aerators on your faucet, install and use water-efficient landscaping and irrigation methods (for example, plant drought tolerant plants and/or install permeable surfaces and drip irrigation systems), and use EnergyStar appliances.

5. Unplug it

Did you know that appliances, chargers, home theater equipment, stereos, and televisions use electricity even when their power is off? Eliminating this "leaking" electricity could save you 6–26 percent on your average monthly electricity bill. Take a walking tour of your home, unplug seldom-used appliances, and install power strips so that the power to frequently used items can be easily turned off.

6. Change the lights

Replace any incandescent light bulbs that remain in your home with compact fluorescent lights (CFLs). Replacing one incandescent light bulb with a CFL can save $30 or more in electricity costs over the bulb‘s lifespan.

7. Set your Thermostat for the Season

Set your thermostat in winter to 68°or less during the daytime, and 55° before going to sleep (or when you are away for the day), to save 5-20 percent of your space-heating costs. During the summer, set thermostats to 78° degrees or more to save 5-20 percent of your cooling costs. For an easy fix, purchase an inexpensive programmable thermostat that makes these changes for you.

8. Increase Energy Efficiency at home

Did you know that you can save up to 350 pounds of CO_2 and $150 per year at home by simply keeping air filters clean? To determine more ways to increase energy efficiency, take advantage of free home energy audits offered by many utility companies. When you are ready to purchase an appliance, ensure that you purchase an EnergyStar appliance. To reduce carbon emissions associated with energy use, install or purchase alternative energy for your electricity needs.

9. Stop Unwanted Services

Did you know that junk mail production in the U.S. consumes as much energy as 2.8 million cars? Stop your junk mail at www.directmail.com/junk_mail. Stop unwanted catalogs at www.catalogchoice.org.

10. Get your friends and families to reduce their carbon emissions

Appendix C: City Council Resolution Number 4201 Adopting the CAP

Appendix D: CEQA Notice of Determination

Appendix E: Initial Study, Draft CAP, and Legal Notice